the JACK LONDON BART FEASIBILITY STUDY

DECEMBER 2004

ACKNOWLEDGEMENTS

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"...the connection between downtown Oakland and the Jack London Square District is a necessary component to create the energy that both destinations need to thrive."

INTRODUCTION

Jack London Square has always been a hub of activity, first as an active seaport and more recently as an entertainment district for Bay Area residents and visitors. Located ten blocks south of the heart of downtown Oakland, Jack London Square (JLS) offers a glimpse into the history of Oakland's industrial seaport, which has been adapted to provide visitors a unique experience that capitalizes on the port's identity. The area features a cluster of entertainment venues, including restaurants, bars, performance spaces, and a movie theater. While these activities raise Jack London Square's profile as a regional destination, **the area is separated from downtown by the I-880 freeway and is just far enough away from BART that it requires additional effort to reach, limiting its visitors.** Given the perception of inaccessibility, stakeholders in the Jack London District, including the Port of Oakland, local merchants, residents, and developers, were interested in improving connections to downtown Oakland, the BART system, and adjacent neighborhoods. These interested parties brought their concerns to the City of Oakland and the City requested that BART initiate a study on how to better connect JLS to the downtown area and the BART network.

"Ultimately...a variety of transit alternatives were considered and compared in this study through input that included community meetings and technical analysis..."

1.1 Project Background

In 2001, the City of Oakland requested that BART study an infill station in the vicinity of Jack London Square on the existing train line. The City of Oakland's Estuary Policy Plan (1999), an element of the City's General Plan, had also identified the need to connect JLS to downtown. BART conducted an Opportunity Scan to examine future land use and transportation opportunities, identify stakeholders, develop project goals, and develop a scope of work for further study.

After this initial assessment, stakeholders comprised of local business owners, nonprofit agencies, and residents supported BART staff's effort to seek funding to study the feasibility of an infill BART station in greater detail. In 2003, the City of Oakland and BART obtained funding from the Caltrans Community-Based Transportation Planning Grant Program to proceed with the study.

BART initiated the Jack London BART Feasibility Study in 2003 to determine the feasibility of constructing an additional BART station near Jack London Square. Ultimately, however, a variety of transit alternatives were considered and compared in this study with input that included public meetings and technical analysis, such as technology options, ridership forecasts, engineering and operations analysis, and estimated construction and operating costs.

1.2 BART's Priorities and Project Goals

BART has established the following goals to determine and prioritize its system expansion projects:

- Enhance regional mobility, especially access to jobs.
- Generate new ridership on a cost-effective basis.
- Demonstrate a commitment to transit-supportive growth and development.
- Enhance multimodal access to the BART system.
- Develop projects in partnership with communities that will be served.
- Implement and operate technology-appropriate service.
- Assure that all projects address the needs of the District's residents.

In addition to BART's system expansion goals, the project stakeholders identified the following goals and objectives in 2002 for the Jack London Study:

- Examine the feasibility of a BART station in the JLS vicinity to improve regional transit access and intermodal connections.
- Generate new transit ridership on a cost-effective basis, encourage off-peak ridership, and support entertainment uses.
- Enhance the regional image and identity of the entire Jack London District.
- Support mixed-use, higher-density development and a pedestrian-friendly environment.

1.3 The Planning Process

In 2003, BART began the study by assembling a Project Team, which consisted of local partners including: the City of Oakland, City of Alameda, Port of Oakland, and AC Transit. BART also finalized the workscopes, budgets and agreements for its consultants, which included: MIG, LTK Engineering Services, and Fehr & Peers. To provide oversight, the Project Team assembled a Policy Advisory Committee (PAC), which consisted of BART Board Members, Lynette Sweet and Carole Ward Allen, and Oakland City Council Members, Danny Wan and Nancy Nadel. In addition, the Project Team considered future Alameda Point improvements, as well as AC Transit, Capitol Corridor, and Ferry plans to determine how they might affect this study.

The study included four stakeholder meetings at which the Project Team received comments from representatives of local agencies, nonprofit organizations, businesses, and residents.

In December 2003, the Project Team conducted the first Stakeholder Meeting. Three conceptual alternatives were presented at this meeting: the BART Infill Station, an Underground BART Shuttle, and an electric streetcar. At the request of a stakeholder, an additional alternative was included for consideration: Group Rapid Transit (GRT).

BART engineering and operations staff then reviewed the feasibility of an infill station on the existing BART line in the vicinity of Jack London Square. An infill station at the desired location would not fit into the existing track geometry without major modifications. Consequently, it was determined to be infeasible and not reviewed further. An infill station closer to West Oakland was found to be feasible, but did not satisfy project goals given its distance from JLS.

BART staff considered many alternatives which they presented to the public for review throughout the study.

Consultants also considered a GRT alternative and determined that it would not be an appropriate technology given the goals of the study and local preferences. As a result, this alternative was also no longer considered in the study.

The two other transit alternatives: an electric streetcar connecting JLS to the 12th Street Station area and an Underground BART Shuttle connecting JLS directly into the 12th Street Station itself were both carried on for further

analysis. The Project Team developed conceptual alignments, service assumptions, operational and maintenance plans, and rough capital and operating costs for these two alternatives. Based on travel demand models, fieldwork, interviews, and a review of comparable systems, consultants also estimated future ridership for these two alternatives.

The Project Team conducted a second Stakeholder Meeting in March 2004 to present the two alternative transit options still under consideration. The PAC was intrigued with the long-term prospect of a new BART line beginning at 12th Street Station that could link to both JLS and Alameda, with either a single or double track. These "Alameda-oriented" BART extension concepts have the potential to be further investigated in upcoming 2005 studies sponsored and directed by the City of Alameda. The PAC, however, was not interested in further investigation of a single-tracked underground BART shuttle that simply terminated at JLS, given its relatively high costs.

To improve both the connection from the 12th Street area to JLS and downtown circulation, the PAC advised staff to continue to refine and explore the streetcar alternative. It also advised that staff consider rubber-tire (bus/shuttle) alternatives to a streetcar.

Given this direction, the Project Team hosted an interactive design "charrette" as the third Stakeholder Meeting in July 2004. The Team presented five streetcar alignment options to the stakeholders for feedback, encouraging participants to formulate additional routes. All of the options, at a minimum, connected 12th Street to Broadway at 2nd Street near Jack London Square. The Team compared and evaluated the operating characteristics, potential stop locations, capital and operating costs, and the ridership projections for these five options. The Team also presented a rubber-tire (bus/shuttle) alternative for each of the five alignment scenarios.

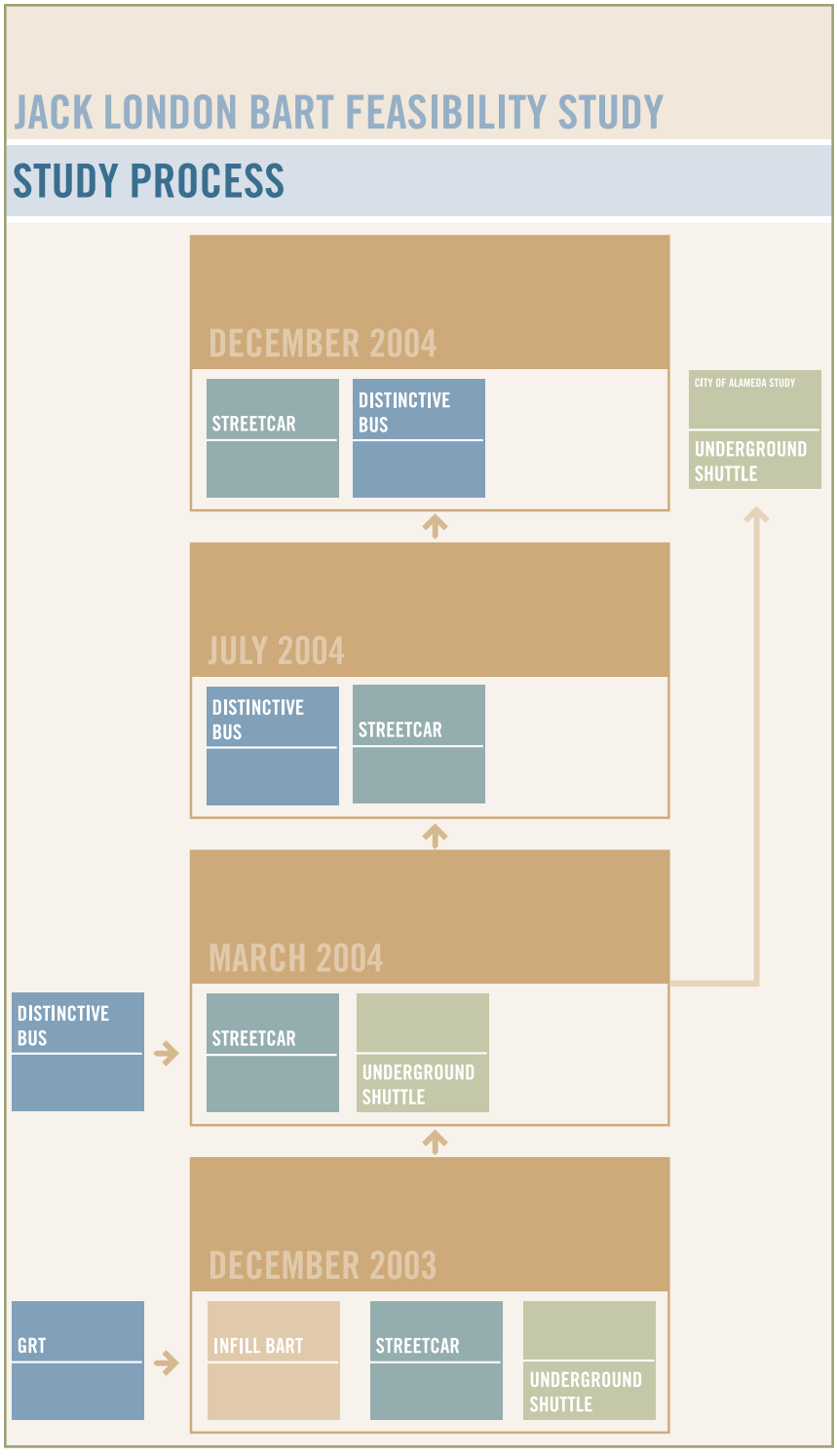
The meeting included an interactive work session to allow participants to compare the five streetcar options. Stakeholders were divided into small groups to discuss the advantages and disadvantages of each alignment and determine which streetcar alignment best met the project goals. No single option appealed universally to all stakeholders, with each generating a list of pros and cons. Two options, however, stood out as having the broadest appeal among participants. The first was the "small" loop option that would use Washington, Franklin and Webster Streets as the primary corridors, and the second was a simple alignment along Broadway. Either of these could serve as the first phase of a potentially bigger circulation system. Lastly, the stakeholders showed little interest in a new, distinctive bus or shuttle service in lieu of, or as a prelude to, a future streetcar.

Following the meeting, BART staff began to develop a funding strategy for the proposed streetcar by first conducting research on other successful streetcar systems in the United States. Given the limited availability of public funds in the near term, the method used by Portland, Oregon and Tampa, Florida that involved a local voluntary assessment district to cover a share of costs was an attractive model. At the request of several stakeholders, BART staff met with developers and property owners in the Jack London District and downtown to discuss the idea.

To refine these two streetcar options further, the Project Team studied the compatibility of a streetcar in these two alignments with current City of Oakland streetscape improvement plans. Given the concerns expressed by the PAC, consultants also analyzed the impact of a streetcar on traffic circulation along these two alignments. Both of these analyses determined that a streetcar would be feasible, but could require some street modifications.

In December of 2004, the Final Public Meeting was held to discuss the study's conclusions and potential next steps. There was strong support from the PAC for a new bus or shuttle service given its lower development costs. At the same time others in attendance considered creating a nonprofit to keep the streetcar concept alive.

PLANNING PROCESS GRAPHIC



"...All this development greatly increases the need for transit options that link Jack London District to other parts of downtown."

EXISTING CONDITIONS

The Jack London District and surrounding districts are experiencing a significant amount of new housing development in response to the Oakland 10K Initiative. Now more than ever, Jack London Square could benefit from a permanent transit service to connect this new residential and mixed-use development to the rest of downtown.

This chapter provides an overview of the Jack London area, including the locations of recent and planned development, increased travel demand, the level of service that currently exists, and the expected transit ridership. The growth in this district will influence the anticipated number of people who choose to use public transit to travel within downtown and to make connections beyond.

2.1 Jack London District

The Jack London District is surrounded by a number of other thriving districts, including Chinatown, Old Oakland, City Center, the Produce District, and the Waterfront Warehouse District. Each district draws its own base of clientele and enlivens downtown with streetscape activity. Further north of downtown is the Lakeside neighborhood and the planned mixed-use Uptown District.

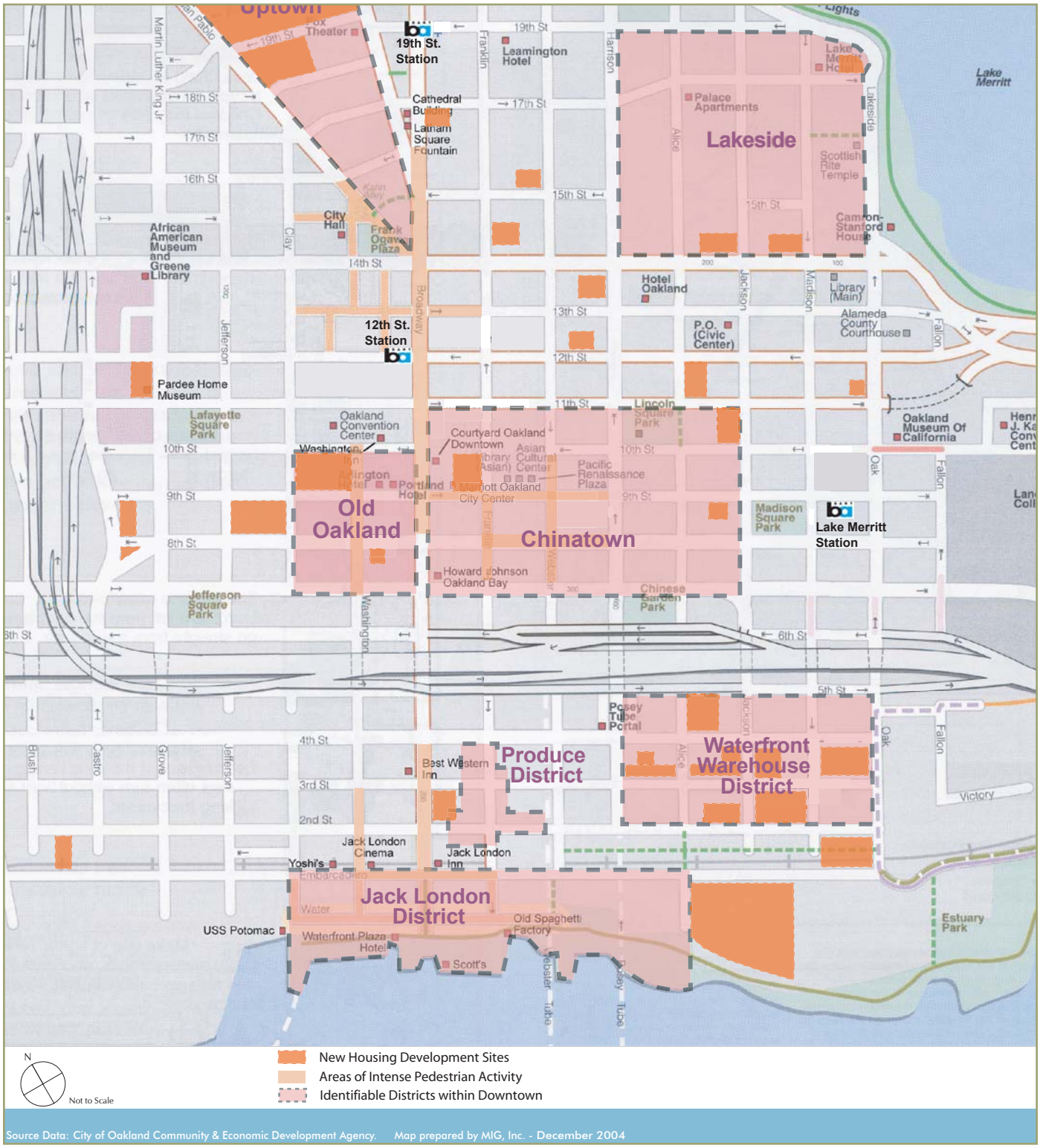
The land uses surrounding Jack London Square are primarily mixed-use industrial, commercial, and residential. Immediately north of the district are warehouses that have been converted into entertainment venues and office space. Interstate 880 (I-880) creates a physical separation between downtown and the southern districts, including Jack London District, the Produce District, and the Waterfront Warehouse District. City government buildings are located on both sides of the freeway along Broadway and Washington Streets.

Spurred by Mayor Jerry Brown's 10K Initiative to bring 10,000 new residents to downtown Oakland, a number of housing development projects are underway throughout the downtown area. These projects are noted in orange in the map to the right. Areas of intense pedestrian activity are noted in tan to illustrate where district activity is the highest.

Old Oakland along Washington Street

Jack London District at Broadway and the Embarcadero

JACK LONDON SQUARE SURROUNDING AREAS DIAGRAM



Source Data: City of Oakland Community & Economic Development Agency. Map prepared by MIG, Inc. - December 2004

The Produce District along Second Street

Chinatown

I-880 separating the District from downtown Oakland

The Phoenix Lofts on Second Street

Source: www.lonestartours.com/loftsunlimited/737-2nd-street

Some housing near Jack London Square has recently been completed. Immediately adjacent to the Square, the Phoenix Lofts on 2nd Street added 29 live-work lofts to the district in 2000. A year later, two new rental properties, the Allegro at Jack London Square and the Landing, opened nearly 600 apartments. In 2002, the Market Lofts mixed-use development on 4th Street constructed 46 new lofts.

Other housing developments are anticipated in the near future, including the Market Square project in Old Oakland, with over 200 new residences (which will be completed in March 2005). Lastly, the Oak to 9th project to the east of the Jack London District, and the Uptown project to the north are underway and will provide thousands more residential units in the area. All this development greatly increases the need for transit options that link Jack London District to other parts of downtown.

2.2 Travel Markets

Given current and future development activity in the Jack London area south of I-880, the number of trips to and from the area are expected to grow significantly over the next two decades. In 2003, there were approximately 48,000 daily trips to and from the Jack London area (south of I-880). This is expected to grow 108% to about 100,000 trips by the year 2025. The biggest driver of this trip growth is the expected increase in the residential population in the area.

The number of residents in the Jack London area, particularly to the east of Jack London Square, is expected to grow significantly by about 131% between now and 2025. As this residential population grows, so will commute trips leaving the Jack London District in the a.m. and returning in the p.m. Many of these trips will be bound for downtown Oakland as well as the BART system to reach San Francisco and other job rich destinations. The new population in this areas means that there will also be a significant amount of trip growth within the Jack London District itself. The number of trips within the District is expected to grow by 70% by 2025.

Given Jack London Square's emergence as an entertainment and retail area, another driver of travel growth will be in social and recreational trips attracted to the Jack London District. These trips will occur disproportionately during midday, evening and weekends, when local transit service is less frequent. At present, the Jack London District is more automobile-oriented, with lower percentages of people using transit than other parts of downtown. For example, the automobile mode share for people working in the 12th Street area is 42%, while in other parts of downtown it is 64% and in Jack London Square it is 75%. This could be due to the relative ease of parking in the Jack London District compared with elsewhere downtown, or the lack of BART service, or both.

2.3 Existing Transit Service

Jack London Square is served by several modes of transit including ferries, Capitol Corridor commuter rail service, Amtrak, and several AC Transit bus routes. The number of AC Transit riders (those getting on or off within the Jack London area south of I-880) is currently about 600 and expected to grow to 1,000 by 2025. About 75% of these are patrons are traveling from the Jack London area to downtown Oakland.

Despite the presence of this transit, there appears to be a market for additional transit services, particularly those that connect to other parts of downtown Oakland or the BART system. The Broadway Shopper Shuttle, a free service which ran from 11 a.m. to 2 p.m. on weekdays, carried nearly 1,200 riders daily before it was discontinued for lack of funds.

"The cost estimates, project benefits, community support, and construction feasibility of each alternative were considered..."

ALTERNATIVES CONSIDERED

Five transit alternatives were considered as a means to better connect JLS with downtown Oakland and the 12th Street BART Station, including:

1. **Infill BART Station**
2. **Group Rapid Transit (GRT)**
3. **Underground BART Shuttle**
4. **Streetcar**
5. **Distinctive Bus or Shuttle**

Each of these five alternatives are described in this chapter. The cost estimates, project benefits, community support, and construction feasibility of each alternative were considered during this process.

Based on initial findings, the Infill Station and GRT were removed from the study process and further analysis focused on the feasibility of the streetcar and the underground shuttle. Based on stakeholder and PAC input, the options were further narrowed to focus on the streetcar alternative with the inclusion of a distinctive bus or shuttle alternative.

3.1 Infill BART Station

An infill station is a new station built on an existing BART line between existing stations. This alternative would provide direct connections between the Jack London District, downtown Oakland, and San Francisco.

BART has established a variety of criteria for the development of potential infill stations, including track configuration, slope, and maintenance of service throughout construction. Also, a new station cannot impact throughput capacity and proper train sequencing through the Oakland Wye and Transbay Tube. To satisfy these operational requirements, a new station in this general area would require a minimum of three tracks, with one reversible track operating in the peak direction. The proposed infill station would resemble MacArthur Station with multiple tracks. Using these criteria, BART staff examined three alternative infill station possibilities:

Option 1:

Original Concept – A station site at the exit of the Washington Street BART Portal.

Option 2A:

A station site on existing track between Castro and Market Streets.

Option 2B:

A station site on existing track between Market and Filbert Streets.

OPTION 1: INFILL STATION AT WASHINGTON STREET PORTAL

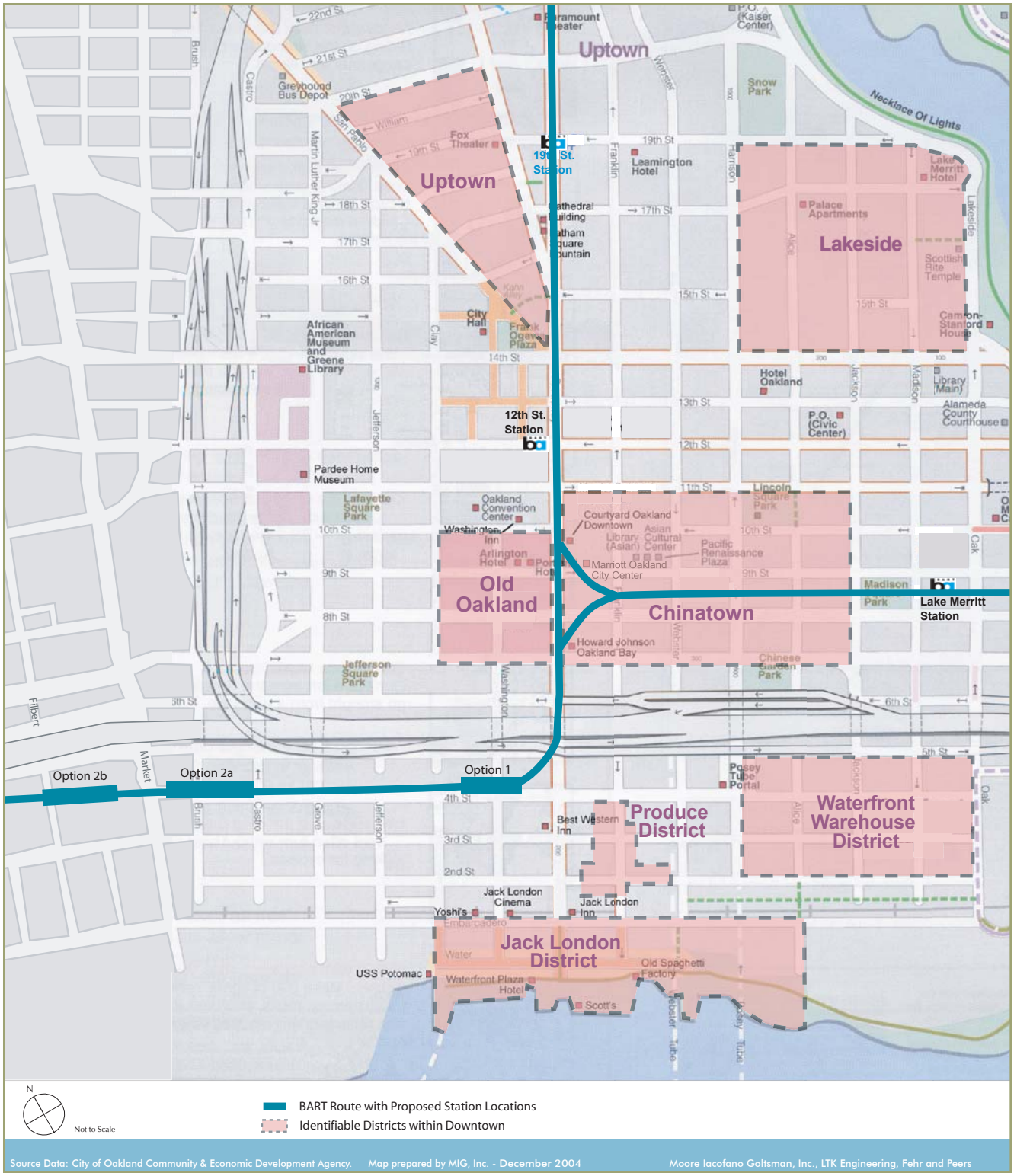
The installation of a station at the exit of the Washington Street BART Portal would provide the greatest proximity to Jack London Square.

The track in the vicinity of the Portal has a 3.75% grade, while BART's station design criteria require an overall grade of 1% or less.[1] Consequently, to allow for the necessary grade at an infill station, some tracks that converge underground in the Oakland Wye would have to be reconfigured. Moreover, the three switches located in this area of track would need to be maintained. The addition of a station would thus entail the relocation of the existing switches westward towards the West Oakland Station. In so doing, the aerial structure would need to be reconfigured to carry the three tracks and associated switches.

These factors would make the location of a station here an enormously costly endeavor with significant operational impacts in the densest portion of the BART system where routes merge and diverge. Since revenue service would have to be maintained during construction, this would add greatly to the complexity and cost of the project. While the precise cost of such an endeavor is unknown, it is many more times greater than other options considered in this study. A thorough analysis of this option would require substantial funds for an engineering review.

[1] As an example, a 1% grade over the length of an 800-foot platform would produce a difference of 8 feet between the two ends of the platform.

INFILL BART STATION LOCATION DIAGRAM



"The track in the vicinity of the Portal has a 3.75% grade, while BART's station design criteria require an overall grade of 1% or less."

OPTION 2A: INFILL STATION BETWEEN CASTRO AND MARKET STREETS

Another option is to locate the station closer to the existing West Oakland BART Station, utilizing the existing track configuration and conforming to design criteria. One such location for such a station exists between Castro Street and Market Street. To utilize this site and maintain operational flexibility, a third track would need to adjoin one of the two platforms. Unfortunately, the vertical curve in the existing trackwork leading out of the Portal compresses the available space for a turnout and crossover to be installed, and precludes this track from fitting between the Portal and this particular site. However, locating the station slightly further towards the West Oakland Station to make room for the turnouts and crossover only pushes the station past the available straight section of track. As a result the station cannot be constructed at this location to meet BART's criteria and is therefore not a viable option.

OPTION 2B: INFILL STATION BETWEEN MARKET AND FILBERT STREETS

A final infill option was evaluated that would meet the minimum three-track configuration needed for operations. This option entails the installation of additional switches and crossovers to configure a three-track station that meets both operational and station design criteria. For this option, three completely new aerial tracks (30 feet in height) would need to be constructed. Switches

The elevated tracks in the vicinity of Jack London Square were considered as a site for an infill station.

would be needed to tie the new tracks to the mainline tracks. The distance from the Portal needed to install station platform, switches, and crossovers would likely put the station between Market and Filbert Streets.

In order to construct the new track alignment and station, new rights-of-way would need to be acquired. It appears that about eight city blocks would be needed, which would cause displacement of approximately 15 businesses and 5 residences. In addition, the traffic flow would be severely restricted in the area during construction.

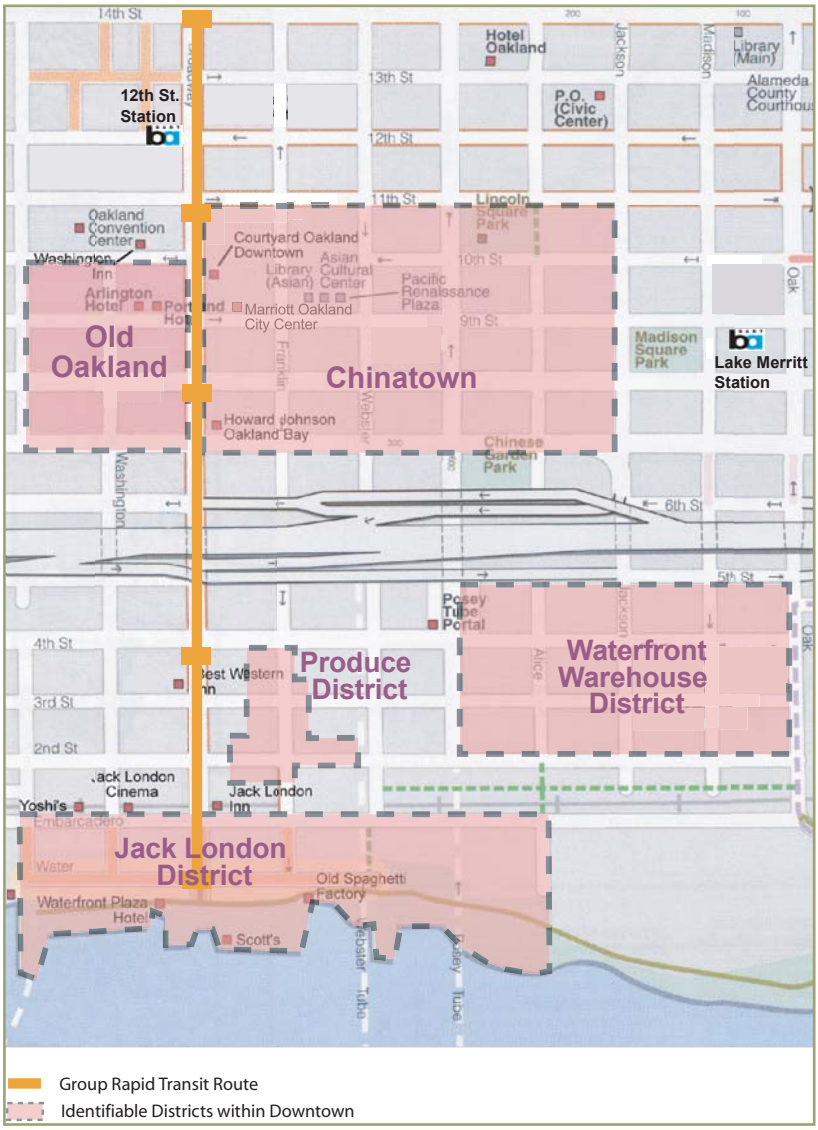
While this option is technically feasible, its high costs (approximately $250-300 M) make it an unattractive option. Most importantly, its location is far enough away from the heart of Jack London District to put it at odds with the study's goal of better linking this neighborhood with downtown Oakland and the region. This alternative was dropped from further analysis.

3.2 Group Rapid Transit (GRT)

A Group Rapid Transit (GRT) system would be comprised of a fleet of small- to medium-sized vehicles operated on a grade separated guideway. GRT guideways can be at grade, elevated, or underground; for this particular application, an elevated structure was assumed. The primary distinction of a GRT system as compared to more traditional automated guideway transit is the ability to bypass stations, allowing vehicles to provide service between two non-adjacent stations. BART's consultants evaluated a potential elevated GRT system for the Jack London District, specifically considering the technology developed and marketed by CyberTran Inc. (CTI) of Alameda, California. However, the CTI system is not currently in any revenue service application anywhere, nor is there yet a fully functional prototype in operation. As such, despite some potential advantages of the GRT concept, the use of this technology for a Jack London District application presently comes with a variety of risks and downsides.

Source: www.poitra.com

GROUP RAPID TRANSIT DIAGRAM



Source: www.cybertran.com

These images of GRT concepts illustrate the elevated monorail and driverless cars of a hypothetical GRT system.

The CTI Group Rapid Transit concept is at a very early stage in development. It still needs concept refinement through engineering, prototype development, regulatory review, testing, revenue application, modification, and general applicability. Until it has moved farther along in the development process, it is a risky option for an application in the context of downtown Oakland and JLS. In time, it may become a reliable, cost-effective, and attractive modal and technological choice for some applications.

Moreover, the proposed CTI technology uses an aerial guideway beam that functions as a track for vehicles, and consequently requires supporting structures for beams. These structures would have to be designed with great care so as not to interfere with fire and emergency crews, traffic patterns and flow, visual lines of sight, and views of existing architecture and other sites of interest. The beam and associated elements would also cast permanent shadows. Altogether, there could be significant visual and physical intrusion into the urban environment, which may not be appropriate in neighborhoods like Old Oakland, Chinatown, and JLS. Overall this impact was deemed undesirable for this context. Other locations may eventually prove to be more appropriate for this technology. Therefore, this alternative was dropped from further analysis.

3.3 Underground BART Shuttle

Another alternative considered was an underground BART shuttle connecting the 12th Street BART Station with an underground station in the heart of JLS. This would involve the creation of a new BART line under Broadway. The underground shuttle would improve transit frequency, speed, BART connectivity, route permanence, vehicle comfort, and image over the existing bus service, generating 3,000 - 4,000 net new weekday transit riders by 2025. On weekends, new ridership would be about half the weekday figures. The benefit of an underground shuttle is that it could take travelers from downtown right into the heart of JLS with a quick travel time of about two minutes, which is the fastest of all the options. This could also be a potential point of departure to Alameda and conceivably even across the Bay over the long-term.

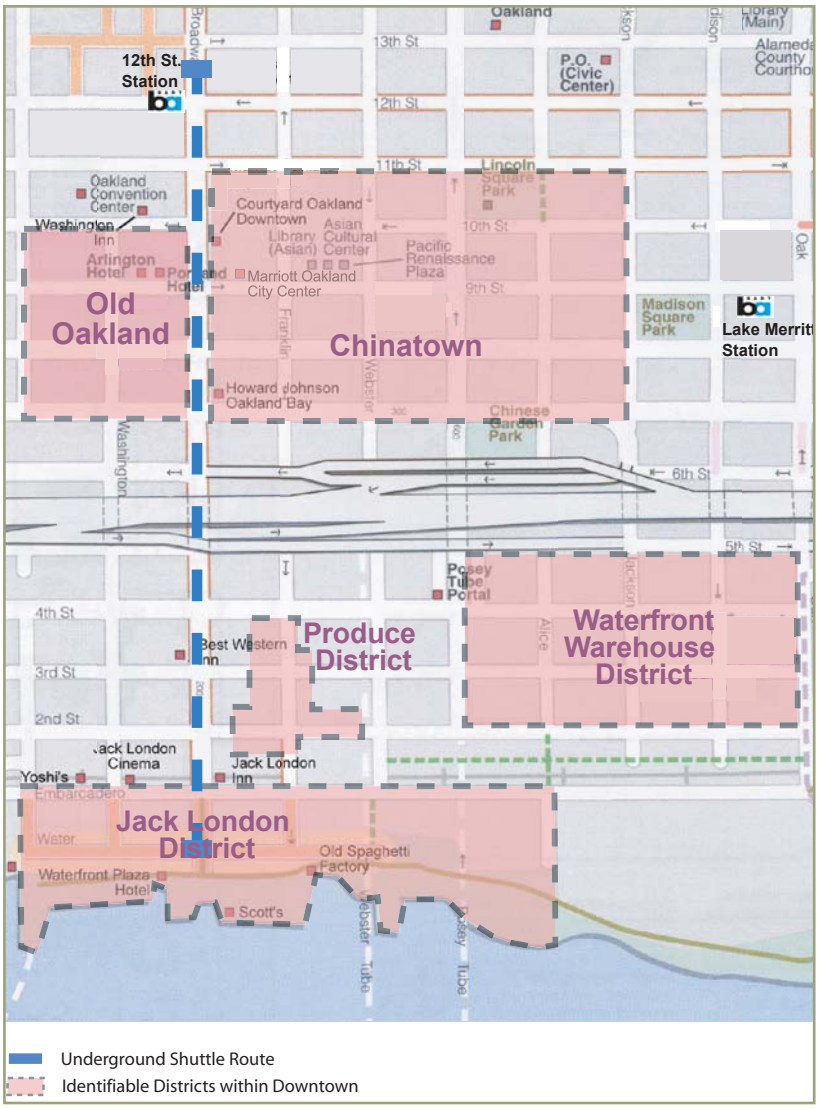
The current single-sided platform on the lower level of the 12th Street Station would be expanded to allow for a center platform with the existing BART tracks on one side and the new BART shuttle track on the other (see image to the right). This would allow a direct cross-platform transfer for San Francisco/Fremont-bound passengers to JLS. Richmond- and Pittsburg/Bay Point-bound passengers from JLS would transfer on the upper level platform. The shuttle could be designed to fit into existing BART system infrastructure,

using a BART guideway, vehicles, and train control, and operating with a standard BART fare structure.

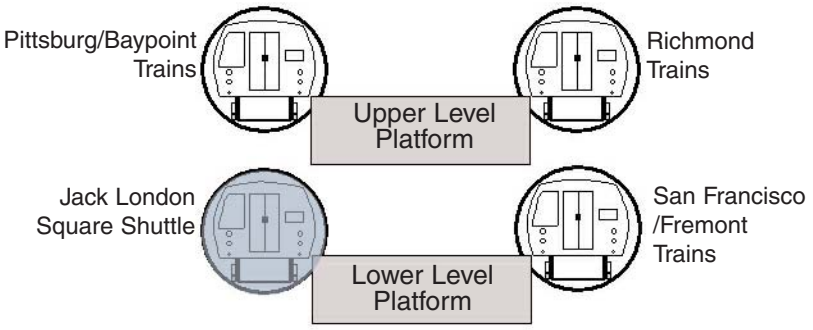
BART has operational objectives that would have to be met for this concept to be viable. First, the BART shuttle system could not be allowed to disrupt existing BART operations. Second, the interface between the existing BART system and the new BART shuttle system would need to be as seamless as possible, without significantly inconveniencing passengers who wish to transfer from one line to the other.

In order for the BART shuttle system to integrate seamlessly with the existing BART system, the BART shuttle operating plan must complement and operate as an extension of the BART system. The hours of operation must match BART's hours of operation. The level-of-service should allow for coordinated headways between the BART shuttle and the BART system to facilitate easy transfers. The headway should be no longer than the minimum BART route headway during the peak, which is currently around five minutes on the Pittsburg/Bay Point - SFO/Daly City/Millbrae route. Off-peak headway can be reduced to 15 minutes or 20 minutes on the evenings or weekends to match BART's base operating headway. The shuttle system is assumed to be operated with a train operator, though the possibility of a "driverless environment" was considered and would require further study.

UNDERGROUND BART SHUTTLE



The image below indicates how the underground shuttle would fit within the 12th Street Station.



The image above (left) shows the Square as it exists today; the image above (right) illustrates what the entrance to the underground shuttle could look like.

Unless the system were automated, BART would also require adequate facilities for an end-of-line operations area and staff break room for train crew supervisors to observe and monitor train and platform operation as well as provide reporting and break location for train operators per BART's Facilities Design Criteria. Maintenance would be performed in current maintenance facilities that are adequate to handle the additional small number of car hours. Access to these facilities would be achieved through a track interlocking south of the 12th Street BART station, tying the new shuttle tracks to existing tracks. This project would cost in the range of $180-250 million with an annual operating cost of $2-4 million.

The complication would be the need for tunneling under Broadway or an adjacent street, which would have impacts on the surface. While construction would not require the length of Broadway to be excavated, it would require two to three excavated areas of about one block in length each. In addition, BART would have to maintain weekday revenue service during the construction, which could not negatively impact throughput through the Oakland Wye and Transbay Tube.

The Underground Shuttle with a terminus at JLS was not considered by the PAC to be worth further investigation in this study given its high capital costs. However, a shuttle that could connect downtown Oakland to Alameda, with a combined or intermediary stop at JLS, was considered more desirable and worthy of further review. Such an endeavor was beyond the scope of this study. However, this concept will likely be further investigated in a 2005 study sponsored by the City of Alameda.

3.4 Streetcar

The fourth alternative studied was the electric streetcar. There is a range of options to consider with surface operating rail technology. The fastest and highest capacity technology, which often involves multiple vehicles and a regional scope is commonly known as light rail transit (LRT), as found in Sacramento, Salt Lake City, and Denver. At the lightest end of the spectrum are historic or museum operations, which typically use single vehicle vintage trolleys (such as in Charlotte, Seattle, and Memphis). This service is typically slower with a lower capacity, but also a lower cost. The proposed streetcar to Jack London Square is a single car system that could use modern or vintage vehicles, or both.

The single car streetcar system works best in areas with short trips and high passenger volumes. Several streetcar builders produce modern cars that are smaller than regional light rail vehicles. They emphasize easy access with short distances between stops rather than high top speeds and longer station spacing. Streetcars usually have short distance between stops (500 - 1000 feet), and frequent service (approximately 10 minute wait times).

The streetcar proposal would offer ADA compliant level boarding from the sidewalk. It would use a double track and generally operate in mixed traffic. Modern track installation and construction is relatively simple and fast, a benefit to local businesses that can be affected during the construction phase of infrastructure projects. The proposed construction technique, as recently used in Portland, is called shallow track method. It allows most utilities to remain in place, reducing

Historic streetcars, such as this one, are being reintroduced into cities across the country. San Francisco has had tremendous success with their historic streetcars.

Portland, Oregon

An example of the track construction is shown in the image above.

There are successful examples of streetcar systems throughout the country. The images below show how streetcars have fit into the urban context in Portland, Oregon and Tacoma, Washington.

Portland, Oregon

Tacoma, Washington

Portland, Oregon

Portland, Oregon

cost and shortening construction time to a few weeks per block. The track depth is typically 12 inches.

The benefits of a streetcar are numerous. It is the cheapest rail option since it is constructed on the surface and requires relatively minimal street interference during construction. The system could operate with modern cars or historic Oakland cars or some combination. The streetcar could also be expanded in any direction and could serve as a circulator for the downtown area.

In addition to its transportation function, the streetcar could also be part of an economic development strategy for downtown Oakland. The streetcar has the potential to enliven the streetscape and spur development on underutilized parcels. Track infrastructure laid in the street has a permanence that sends the message that investment and the value it brings is there to stay. In addition to connecting the Jack London District to the City Center area, the streetcar could serve adjacent districts, providing them with an attractive transit service that could help to activate broad areas of downtown. Other cities that recently implemented streetcars consider them catalysts for development of underutilized parcels.

A disadvantage of the streetcar is that, though cheaper than other rail options, it still has a higher capital cost than a rubber-tire bus or shuttle

option. It would also require more stops than the underground shuttle, making it slower (for trips from 12th Street Station to JLS). Finally, due to Federal regulations, it cannot cross the train tracks on the Embarcadero at grade, and, therefore, could not stop in the heart of JLS without a tunnel or bridge.

The streetcar alternative would improve transit service frequency, route presence, and vehicle image, adding approximately 2,000 - 3,000 net new transit riders each weekday by 2025 to the projected baseline transit ridership of 1,000 daily riders.

Depending upon the size of the initial system, a streetcar alternative for the Jack London District is generally estimated to cost between $30 - $75 million, with a range of annual operating costs of $1.5 - $5 million. To determine the ideal alignment for the streetcar, the PAC requested further analysis. Potential alignments are discussed in the next chapter.

An historic car in Tampa, Florida has become one of the city's most popular forms of public transit. It is paid for in part by the advertisements you see on the front of the car.

The streetcar is a flexible system that can fit into existing infrastructure, such as under the I-880 overpass, as illustrated here.

BEFORE

AFTER

BEFORE

AFTER

The streetcar has the potential to enhance property values, improve the pedestrian realm, and spark development, as shown in these before and after illustrations of Washington Street at 10th Street.

BEFORE

AFTER

Another example of a before and after illustration at the intersection of Washington Street at 4th Street is shown above.

"Because Jack London Square is a destination that appeals to tourists, the charm of a double-decker bus could encourage visitors to take public transportation."

3.5 Distinctive Bus or Shuttle

The PAC requested that the study consider the alternative of a rubber-tired vehicle such as a bus or a shuttle. As a result, the Project Team analyzed the costs and benefits of bus service for each of the alignment options, with the same operational frequency, run times, and stops as the proposed streetcar. Such an alternative had several advantages. These included a lower capital cost, the flexibility to change routes, and the ability to implement much faster than other alternatives. A bus or shuttle would also have the ability to drive over the railroad tracks on Embarcadero, which could allow a stop closer to the heart of Jack London Square.

The disadvantage of such a service includes lower ridership potential than the other alternatives and higher annual operating costs than a streetcar. Buses and shuttles also tend to have less flair than streetcars, which are more novel and generate more public enthusiasm and support. Moreover, while buses and shuttles are flexible, the lower level of public investment and commitment as compared to a streetcar can translate into a less stimulating effect on development. This could limit the ability of buses or shuttles to contribute to the revitalization of downtown Oakland and adjacent districts.

For all of these reasons, the stakeholders present at the July Public Meeting determined that the disadvantages outweighed the advantages of this alternative as compared to the streetcar. Despite the lack of stakeholder enthusiasm, however, this remains a low cost and technically feasible option if a streetcar lacks funding in the short term. The lack of rubber-tire appeal could be mitigated somewhat with a distinctive bus with an unusual form, such as a double-decker or mock vintage trolley.

Distinctive buses come in many styles. Double-decker buses are often considered more charming than the average bus and capture higher ridership numbers. The image below shows an example of historic trolley cars adapted to operate with rubber tires.

BART SYSTEM EXPANSION CRITERIA TABLE

Criteria	Streetcar Options	Bus Options
Transit Supportive Land Use/Development Plans		
Existing Land Use: Residential and/or Employment	M	M
Existing Intermodal Connections	M	M
Land Use Plans and Policies	MH	MH
Cost Effectiveness		
Cost per New Rider -- Base Case	MH- H	H
Cost per New Rider -- TOD	N/A	N/A
Regional Network Connectivity		
Regional Transportation Gap Closure	LM- MH	LM- MH
System and Financial Capacity		
Core System Improvements	N/A	N/A
Capital Finance Plan	L	LM
Operating Finance Plan	L	LM
Partnerships		
Community & Stakeholder Support	M- MH	LM

Above: The two remaining viable transit alternatives were screened using BART System Expansion Criteria.

H = HIGH
M = MEDIUM
L = LOW

"...A streetcar is a great option offering a connection to Jack London Square, Chinatown, and Old Oakland."

Workshop Participant

REFINEMENT OF STREETCAR ALTERNATIVE

Based on both technical comparisons and stakeholder input, the streetcar system was determined to be the most desirable long-term alternative. Given this preference, the Project Team explored this alternative in greater detail, beginning with the identification of a preferred alignment. Five streetcar alignments were studied as distinct options, with a range in length of track, number of stops, and street routes. These included:

Option 1: Broadway "Spine"

Option 2: "U" Loop

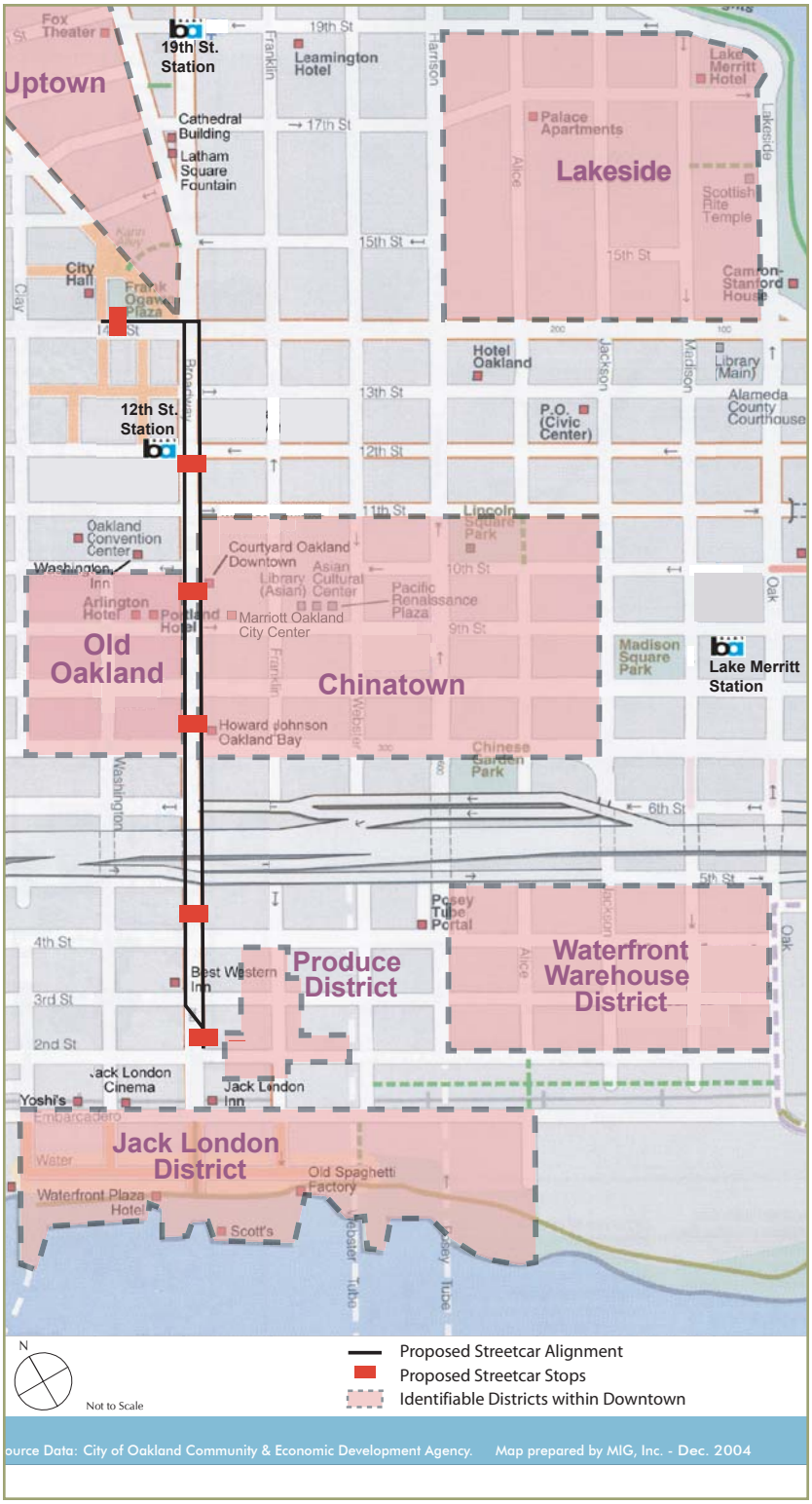
Option 3: "C" Loop

Option 4: "Small" Loop

Option 5: "Big" Loop

From these options, two alignments were considered to be the most viable. Further analysis of these two alignments involved a review of their compatibility with downtown Oakland's streetscape and their impact on traffic.

BROADWAY "SPINE" DIAGRAM



4.1 Alignment Options

OPTION 1: BROADWAY "SPINE"

The Broadway "Spine" alignment would run up and down Broadway, beginning on 14th Street in front of the Frank Ogawa Plaza and City Hall, and ending in the block between 2nd and Embarcadero Streets. This option is the shortest in length at just over half a mile. Six stops would be spaced over the 13 block-span, reasserting Broadway as the spine of downtown Oakland. This could be the first phase of a potentially larger system.

Broadway at 11th Street

Broadway at 2nd Street

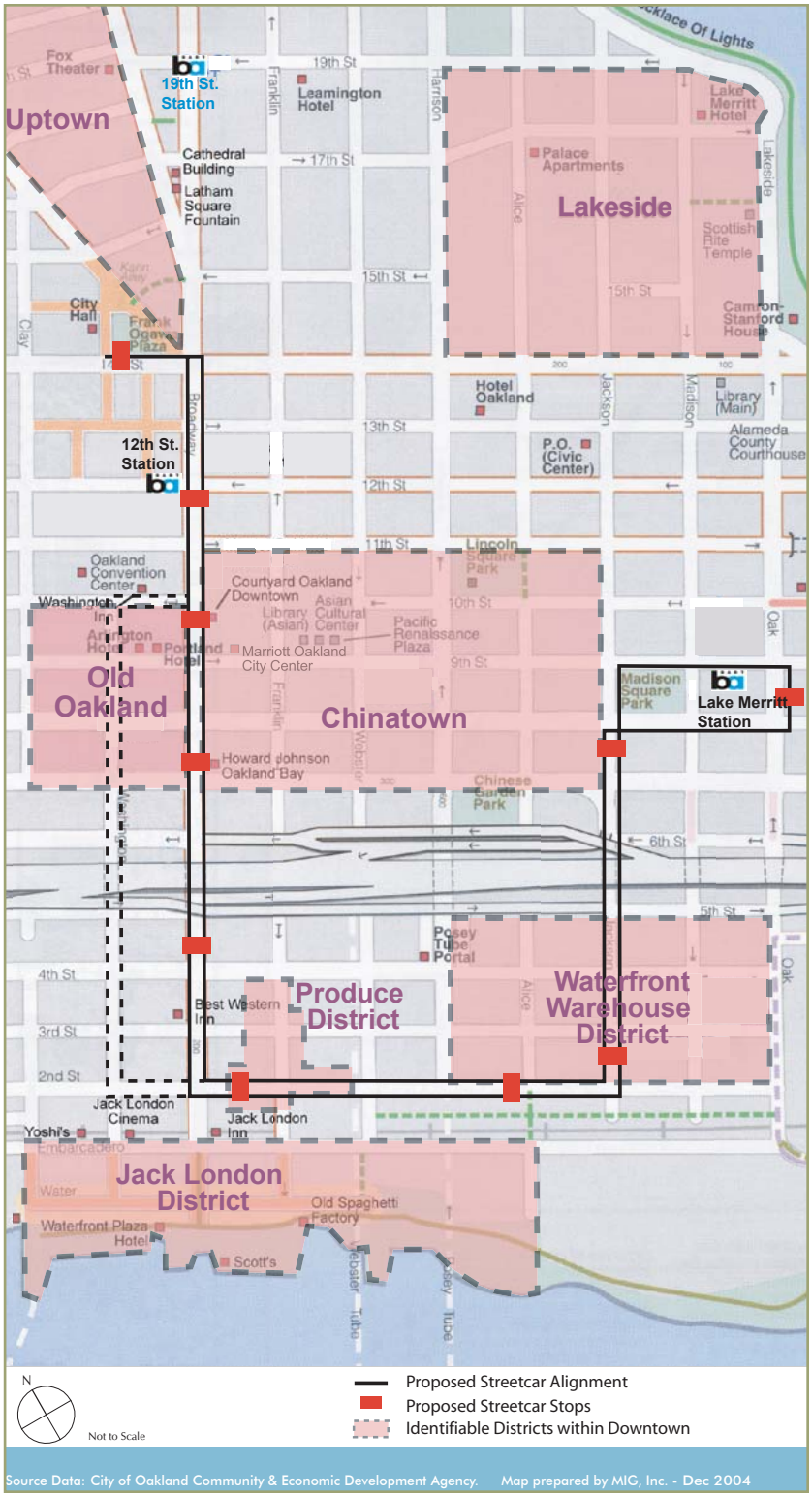
OPTION 2: "U" LOOP

The "U" Loop option extends the first option over to the Amtrak Station on 2nd and Alice Streets and up to Lake Merritt BART Station. This option better serves the Chinatown District and the Warehouse District. In addition, this option has an alternative route down Washington Street, which could more directly serve the Old Oakland District (the technical analysis reflected in the profile below is gathered from the Broadway alignment). The "U" Loop is double the length of Option One at one and a half miles.

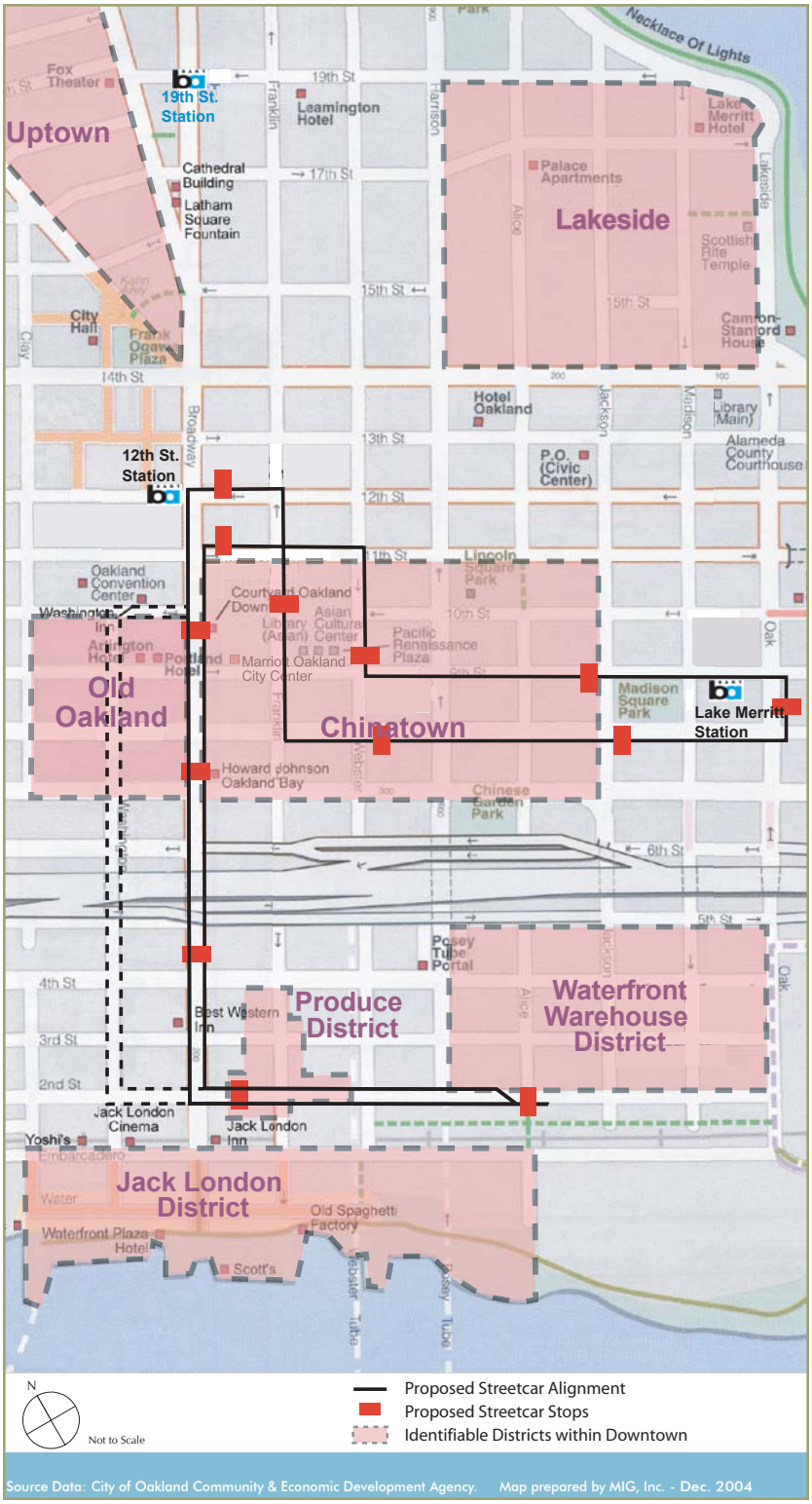
2nd at Harrison Street

Jackson at 3rd Street

"U" LOOP DIAGRAM



"C" LOOP DIAGRAM



OPTION 3: "C" LOOP

The third option is the "C" Loop, which extends the Broadway "Spine" option to the Amtrak and Lake Merritt BART Stations via Chinatown, rather than through the Warehouse District. This option is comparable to the "U" Loop in length, number of stops, ridership, and capital and operating costs. Like Option Two, the "C" Loop has the alternative of running along Washington Street rather than Broadway.

9th at Webster Street

8th at Harrison Street

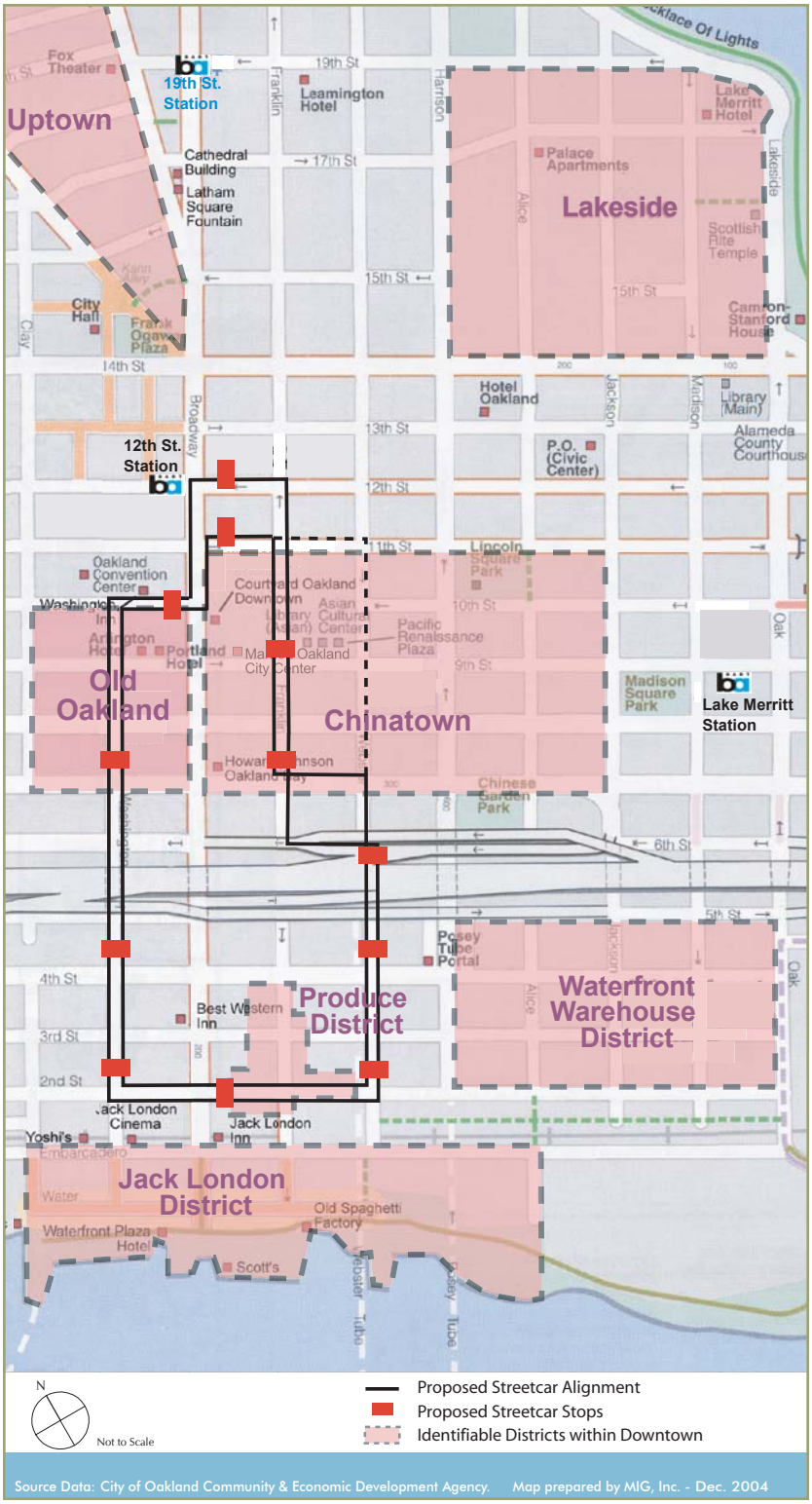
OPTION 4: "SMALL" LOOP

Option Four is called the "Small" Loop because it makes a full loop down Washington Street to 2nd Street, up Webster/Franklin Streets through Chinatown and back to Broadway. It is the only option that does not have an option to travel down Broadway for more than two blocks. It would take slightly longer to reach JLS from 12th Street Station, because its path is less direct than those with Broadway alignments. This option is comparable in route length, and capital and operating costs to Options Two and Three.

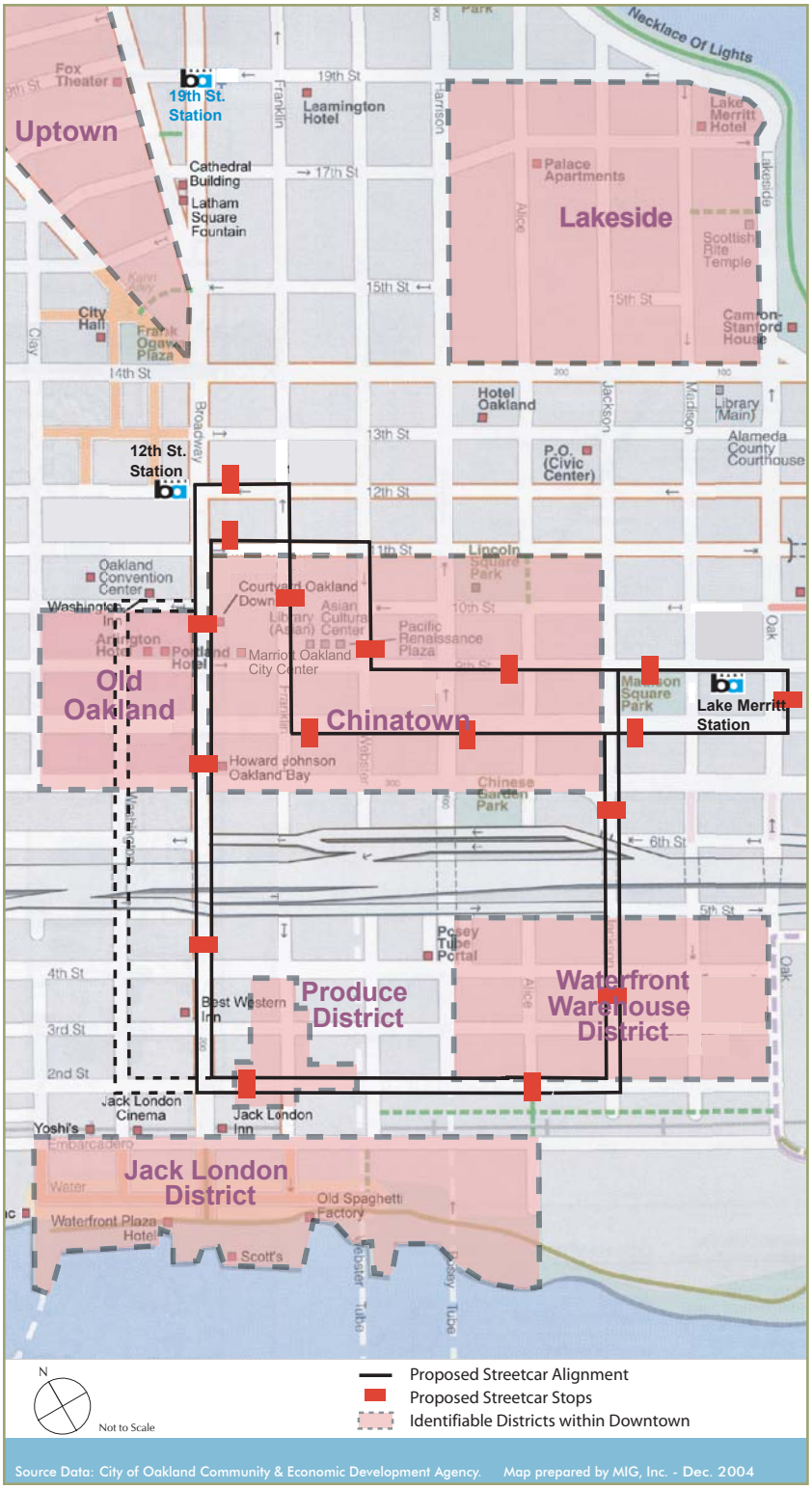
Washington at 4th Street

6th at Webster Street

"SMALL" LOOP DIAGRAM



"BIG" LOOP DIAGRAM



OPTION 5: "BIG" LOOP

The fifth option called the "Big" Loop combines Options Two and Three to make a complete loop connecting JLS and the Amtrak, Lake Merritt and 12th Street Stations. It can be considered a longer-term, full phase option. It has a total length of just over two miles. This option also has the possibility of running up and down Washington Street rather than Broadway.

Webster at 8th Street

Franklin at 9th Street

4.2 Alignment Conclusions

There was no consensus about the best alignment for a streetcar system in downtown Oakland as each of the options generated a list of pros and cons from meeting participants. In general, stakeholders wanted a system with a quick connection from downtown to the Jack London District, as well as the ability to circulate between downtown neighborhoods.

Some liked the simplicity and low cost of the Broadway "Spine" alignment, possibly as the first phase of a potentially much broader circulation system than the "Small" loop. These stakeholders saw Broadway as Oakland's historic parallel to San Francisco's Market Street and the ideal location for a visible transit spine. The Broadway alignment also provides a consistent transit line along the edge of Chinatown, while not interfering with its commerce and activity. This option would be roughly one-half the capital and operating costs of the other alignment options; though, it is also expected to encourage fewer riders than the other five options given its smaller scale. It is the most cost effective of the options with the lowest cost per new rider and could also be most readily integrated and coordinated with existing AC Transit lines to potentially save on operating costs.

The "U" Loop was seen as a potential second phase for a Broadway alignment, with the service heading from the Jack London District to the Amtrak Station and then toward the Lake Merritt BART station and Laney College. This option's ridership would be 50% greater than the Broadway "Spine" option. The operating and capital costs, however, would be 100% greater.

Meeting participants expressed a concern about a streetcar operation in the heart of Chinatown given its density and commercial activity, especially on 8th and 9th Streets. This meant that there was generally less support for the "C" Loop option or a "Big" Loop option.The "Big" Loop has considerably higher estimated capital and operating costs than the other options.

The "Small" Loop option was a favorite of some since it functions like a tight downtown circulator and connects a variety of neighborhoods with tourist appeal. Some also like the fact that this option avoids Broadway, which they view as heavily trafficked and unappealing. This option was considered to better serve Old Oakland and Chinatown, while not interfering with auto traffic and bus service on Broadway. However, its total cost per transit trip is the second highest of the five options.

Finally, many favored the idea of a future phase that extended any streetcar option to Uptown and the 19th Street BART Station. Some also favored the idea of linking the Amtrak Station and Lake Merritt into a downtown transit circulator.

ALIGNMENT OPTIONS COMPARISON TABLE

	Options				
	# 1	# 2	# 3	# 4	# 5
	Broadway	"U" loop	"C" loop	Small loop	Big loop
Profile for Streetcar or Rubber Tire					
Frequency (minutes)	7.5	7.5	7.5	7.5	7.5
Route Length (miles)	0.68	1.54	1.54	1.44	2.12
Number of Stops	6	10	10	12	13
Travel Time (minutes):					
12th Street to JLS	4	4	4.5	5.5	4.5
Chinatown to JLS	N/A	N/A	5.5	5	5.5
Chinatown to Lake Merritt	N/A	N/A	3.0	N/A	3
Lake Merritt to 12th Street	N/A	11	5	N/A	5.5
Performance for Streetcar					
Ridership	2,010	2,940	3,040	2,440	3,120
Capital Cost (in millions of 2004 $)	38	60	64	61	75
Annual Operating Cost (in millions of 2004 $)	1.7	3.4	3.4	3.4	4.2
Performance for Rubber-Tire					
Ridership	1,800	2,630	2,720	2,180	2,790
Capital Cost (in millions of 2004 $)	12	17	17	20	21
Annual Operating Cost (in millions of 2004 $)	2	3.4	3.4	4	4.7
Streetcar Cost Effectiveness					
Est. Total Cost per New Transit Trip (in 2004 $)	$9.66	$11.14	$10.90	$13.60	$13.64
Gross Operating Cost per Passenger	$2.92	$3.99	$3.86	$4.80	$4.64
Rubber-Tire Cost Effectiveness					
Est. Total Cost per New Transit Trip (in 2004 $)	$5.68	$6.25	$6.05	$8.88	$7.80
Gross Operating Cost per Passenger	$3.26	$4.46	$4.31	$5.38	$5.19

Altogether with technical and stakeholder input, the two alignments that have the most overall appeal were:

- **The Broadway "Spine" as the first phase to a broader loop.**
- **The "Small" Loop Option on Washington, 2nd, Franklin, Webster, and 14th Streets.**

As a result, the Project Team focused additional analysis and concept refinement on these two streetcar alignments.

4.3 Streetscape Compatibility

The streetcar system is a flexible rail technology that easily integrates into existing street configurations. The modern electric streetcar is typically 8.5 feet wide and 60 feet in length. Like a bus, it operates in mixed flow traffic lanes, meaning that cars and buses can share the lane with the streetcar tracks; and thus, traffic flow is typically unhindered. Usually, the streetcar operates along the far right travel lane alongside the on-street parking lane. The streetcar stops are accommodated by extending the sidewalk at the corner to the edge of the travel lane (this extension is called a bulb out). In some cases the alignments might include segments of track in the lane next to the median, with boarding from an island platform.

Streetscape improvements along the route should include:

1. Signalized intersections at streetcar stops.
2. Forty-five-foot long sidewalk bulb outs at stops (the width should be no more than the width of the parking lane or travel lane, which is generally eight feet).
3. Consolidation and coordination of light and sign poles for streetcar overhead wiring.
4. A coordinated signage program.
5. Regularly trimmed trees to ensure streetcar clearance.

In addition to these improvements, it is recommended that each stop be outfitted with a shelter, proper lighting, seating options, trash receptacles, and street trees.

Once the two preferred streetcar alignments were identified, the Project Team conducted a more thorough analysis to determine the streetcar system's compatibility with the existing and proposed streetscapes along the Broadway "Spine" and "Small" Loop alignments. The Team reviewed existing right-of-way constraints, ongoing planning efforts, and adopted streetscape improvements along the proposed routes.

Cities across the country are accommodating streetcars within their urban corridors with relative ease. However, to ensure the proposed streetcars' ability to fit in the downtown Oakland environment, three Oakland City plans were reviewed:

1. Pedestrian Master Plan

City of Oakland 2002

2. The Estuary Policy Plan

Oakland, California 1999

3. Downtown Oakland Streetscape Master Plan

City of Oakland

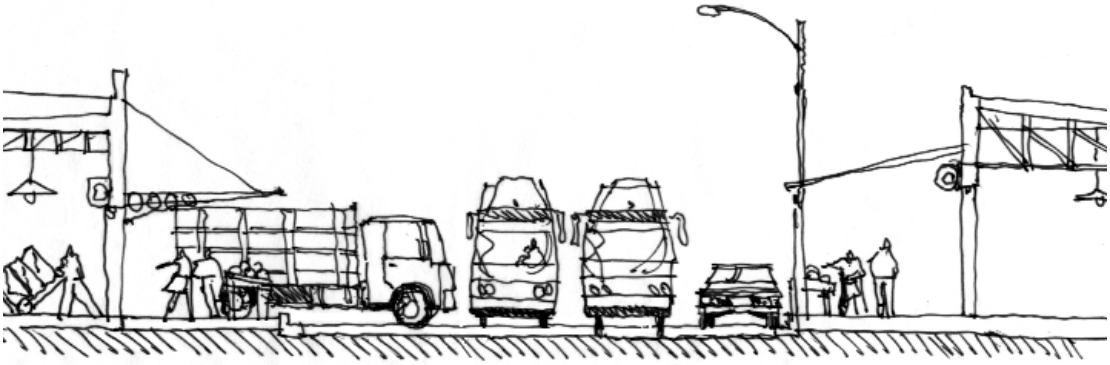
From this review, the Team identified a number of issues for further study as the streetcar design enters its next phase.[2] These are described as follows.

2ND STREET PRODUCE DISTRICT

The Pedestrian Master Plan identifies the Produce District as a key location for improved pedestrian activity and identifies the placement of a trolley line along Broadway to 2nd Street.

[2] In the future, there will be a need to coordinate with the *Revive Chinatown!* Plan for the Chinatown District.

CROSS SECTION OF 2ND STREET IN THE PRODUCE DISTRICT



Consequently, the Pedestrian Master Plan recommends the relocation of the weekly farmer's market to Franklin Street between 2nd and 3rd streets and notes that the wholesale nature of the district is changing. Careful planning will have to take place along this stretch of 2nd Street so that loading and unloading activities do not conflict with streetcar movement and auto circulation. A detailed study of this street should be conducted.

CLASS II AND III BIKEWAYS

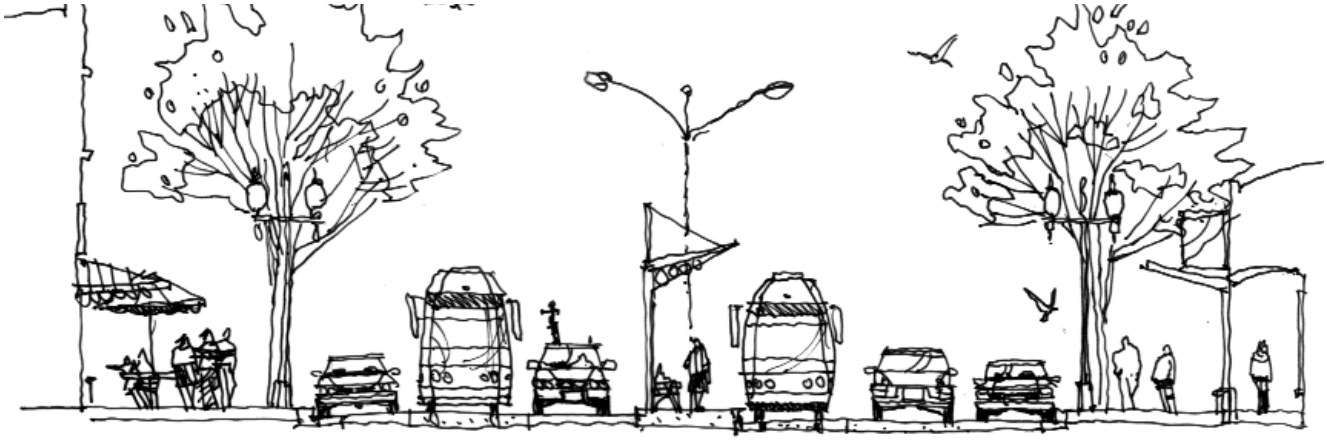
The Pedestrian Master Plan recommends two potential east-west alignments for a class III bikeway (which is often referred to as a bike route for shared use with pedestrian or motor vehicle traffic) along 2nd Street or 3rd Street. In addition, the Plan recommends one north-south class II bikeway (which is often referred to as a bike lane defined by a striped lane for one-way travel) alignment along Washington Street. Streetcar alignment will have to be coordinated with this bikeway.

Given the existing loading and unloading along the Produce District and the potential streetcar route along 2nd Street, this study recommends that the bike route be located one block north on 3rd Street. This alignment maintains bike routes in close proximity to JLS, Old Oakland, and the Produce Market, and would provide a less congested route for bicylists. Designing the exact streetcar alignment along Washington Street will require coordination with the proposed bikeway as well.

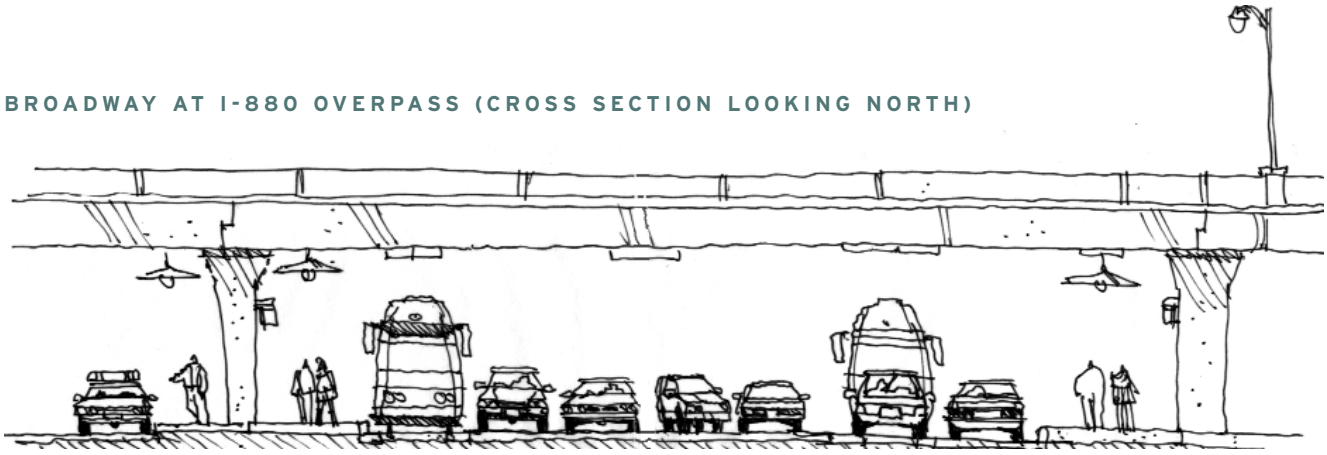
WEBSTER STREET GREEN

The Estuary Policy Plan identifies a major streetscape improvement along Webster Street from 4th Street to the wharf. Webster Street is located directly above the Webster Tunnel leading to Alameda. The tunnel was constructed with a 45-foot easement along the west side of the street that precludes development. Currently the easement is used for surface parking lots. The Estuary Policy Plan proposed creating a 45-foot wide open space down the center of this stretch of Webster Street, thereby shifting the southbound lane of Webster to the west side of the open space. It is imperative that a Webster Street alignment is coordinated with the right-of-way determined for the Webster Street Green.

BROADWAY WITH CENTER ALIGNMENT (CROSS SECTION LOOKING NORTH)



BROADWAY AT I-880 OVERPASS (CROSS SECTION LOOKING NORTH)



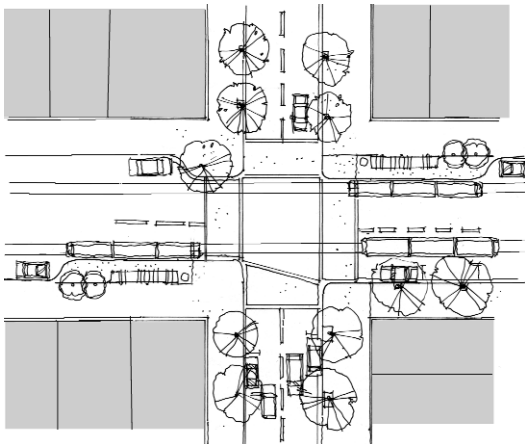
BROADWAY TURNING MOVEMENTS

Significant turning movements on and off Broadway occur between 6th and 9th Streets. To best avoid conflict between the vehicular traffic in this stretch, it is recommended that consideration be given to placing the northbound streetcar along the center median, rather than along the sidewalk. This configuration would require passengers to exit the streetcar on its left side. In lieu of bulb outs, medians at the stops would be widened to accommodate passengers. The increased median width would not reduce the number of travel lanes on Broadway (the existing lanes are wider than the necessary minimum).

BROADWAY AT THE I-880 OVERPASS

Though none of the plans include the Broadway at I-880 area, special planning coordination will be necessary at this location, which has unique traffic considerations. Southbound, Broadway's two through-lanes widen to four under the freeway structure, of which three are left-turn only lanes onto I-880 and only one is a through-lane to JLS. It is recommended that the southbound streetcar tracks steer clear of the turning lanes by running alongside the west sidewalk. To improve circulation, an additional through lane could be added west of the existing through lane, providing two through lanes southbound where there is

TYPICAL STREETCAR STOPS



This plan view drawing shows how the sidewalk bulb outs will provide the streetcar with stops for easy boarding and ample sidewalk accommodations, without reducing the number of travel lanes.

now only one. In such a case, the streetcar would run in the curb lane. This would require reducing the sidewalk (which is now about 20 feet in width) to about 10 feet. General streetscape improvements that have been discussed for the area include public art, overhead lighting, and parking screens to increase the perception of safety. This is a challenging street-level environment from the point of view of pedestrian movement and urban design, but introduction of a streetcar and coordination with streetscape treatments to the north (Downtown Core) and to the south (Jack London Square) could help ameliorate the sense of a divisive barrier created by the I-880 structure.

BROADWAY BUS STOPS

Recent streetscape improvements have been made to Broadway between 12th and 14th Streets to distribute bus stops. The terminus of the streetcar in the City Center area will have to be carefully planned and located to avoid congestion, allow bus boarding to occur as usual, and provide for effective bus/streetcar transfers.

WASHINGTON STREET STREETSCAPE IMPROVEMENTS

The Downtown Streetscape Master Plan is in its final stages of design development for two to three blocks along Washington Street between 7th and 10th Streets. The improvements will consist of the reconstruction of brick sidewalks along this area, and corner bulb outs on 6th, 7th, and 8th Streets to improve the pedestrian realm and accommodate angled street parking on the streets perpendicular to Washington Street. In planning for the ideal placement of a streetcar stop, the alignment will need to be coordinated with bulb outs and respect the recent improvements.

Careful planning in these areas will allow the streetcar system to easily fit into the rights-of-way along either alignment route and can help improve the streetscape activity within these areas. The frequency and activity of the streetcars increases the "eyes on the street" helping to improve the perception of safety along the route. The streetcars' accompanying street furniture and amenities will further enhance downtown Oakland and the surrounding districts.

4.4 Traffic Impacts

In order to refine the streetcar concept further, the Project Team analyzed the traffic impacts of a streetcar operation for the Broadway "Spine" and "Small" Loop options.

A field review of both alignments was conducted to collect information relevant to the streetcar operations. This information included parallel and angle parking characteristics; roadway and intersection lane widths and designations; traffic congestion levels; intersection geometrics and traffic signal control operations; bike lanes; and bus stop and loading locations (See the Traffic Impacts Diagram on the following page). A documentation review was also undertaken to identify previous corridor recommendations that may conflict with streetcar operations along either route.

After reviewing the opportunities and constraints for the two streetcar options, the following locations were identified as potential issues for streetcar operations that would require more in-depth analysis before track construction. None of the issues mentioned below represent fatal flaws that would preclude the implementation of a streetcar operation.

CITY CENTER AREA

The proposed turn-around area, west of Broadway, on 14th Street would impact the operations of the traffic signals along Broadway. Special transit phasing might have to be introduced, potentially creating some additional delay for other traffic.

BROADWAY CORRIDOR

Additional traffic delays caused by in-lane streetcar stops and maneuvers would cause occasional traffic signal "cycles" to exceed capacity. However, intervening cycles, between streetcar arrivals, would allow traffic to clear and the street to return to normal operations. Any reduction of bus vehicles due to the introduction of streetcars could compensate for this impact to some degree.

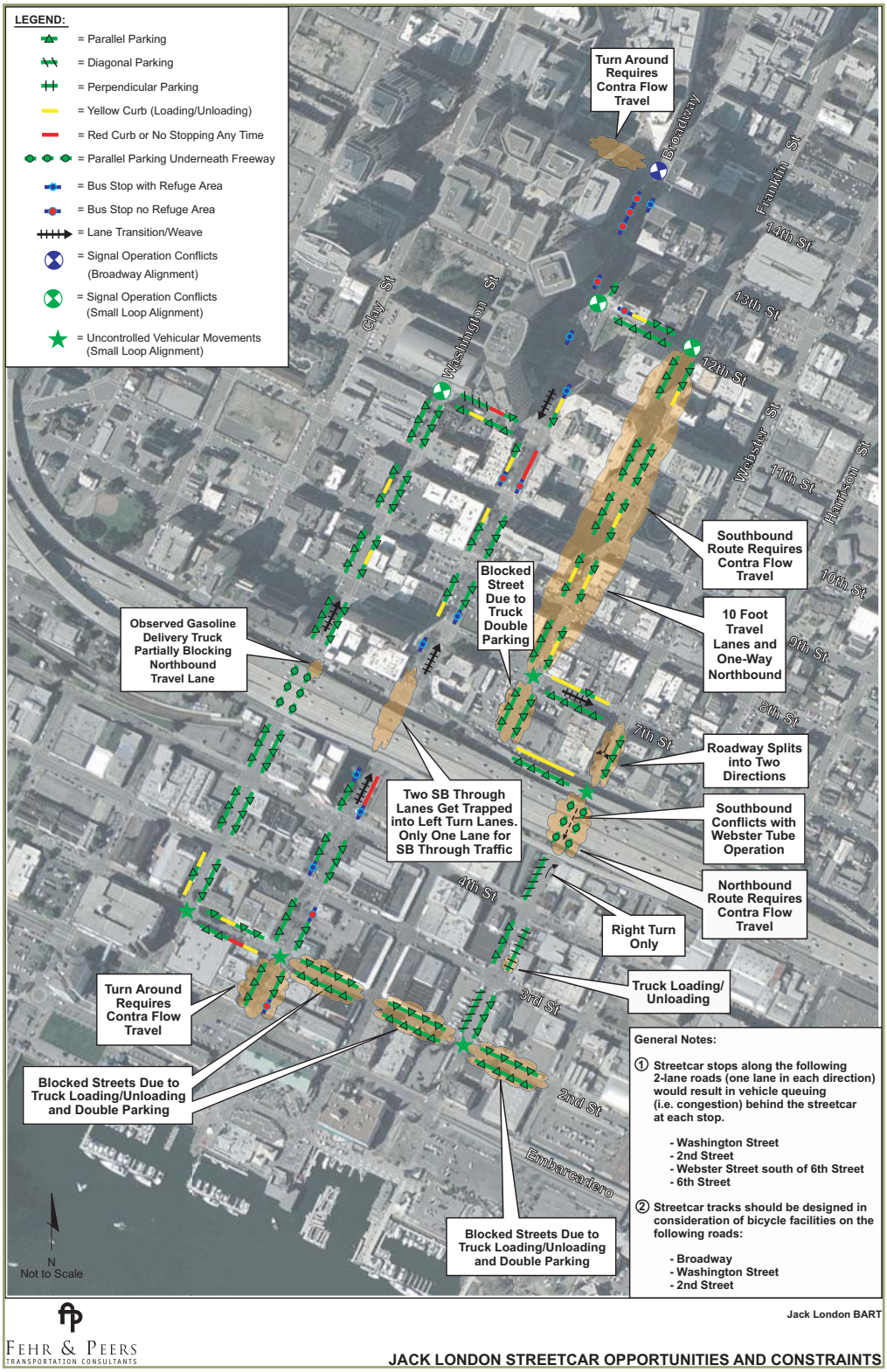
BROADWAY AT I-880

The current operations of Broadway under the I-880 overpass would be complicated by the addition of the streetcar. The southbound movement, which is limited to one travel lane, would be impacted by the streetcar along with the freeway ramp movements. However, alternative streetcar alignments, such as running in the southbound shoulder, are available. Regardless of the specific southbound alignment, we recommend against a streetcar stop in this area.

FRANKLIN STREET

The current lane widths on Franklin Street, 10 feet, are not ideal for use by the streetcar, and might need to be widened, reducing the number of traffic lanes. If Franklin Street is converted into a two-way street, the streetcar would occupy the single lane for through traffic in each direction (with a third lane available for traffic turns).

TRAFFIC IMPACTS DIAGRAM



As a result, while through traffic would still be permitted, it would be slowed by streetcars in the through lanes and by possible parking and delivery maneuvers, so that the character of Franklin Street would likely change to a local-use, "transit first" street. This configuration would need to be coordinated with the *Revive Chinatown!* plans for street changes.

WEBSTER TUBE PORTAL

The current operations of the Webster Tube Portal would be greatly complicated by the addition of streetcar movements. Both the northbound and southbound streetcar routes would be negatively impacted by the traffic entering the Portal. The southbound route would have the greatest impact on Portal operations, as the streetcar would have to weave across traffic entering the Portal at 6th Street before continuing on Webster Street under I-880.

2ND STREET

Delivery schedules on 2nd Street might need to be altered to keep the through travel lanes clear

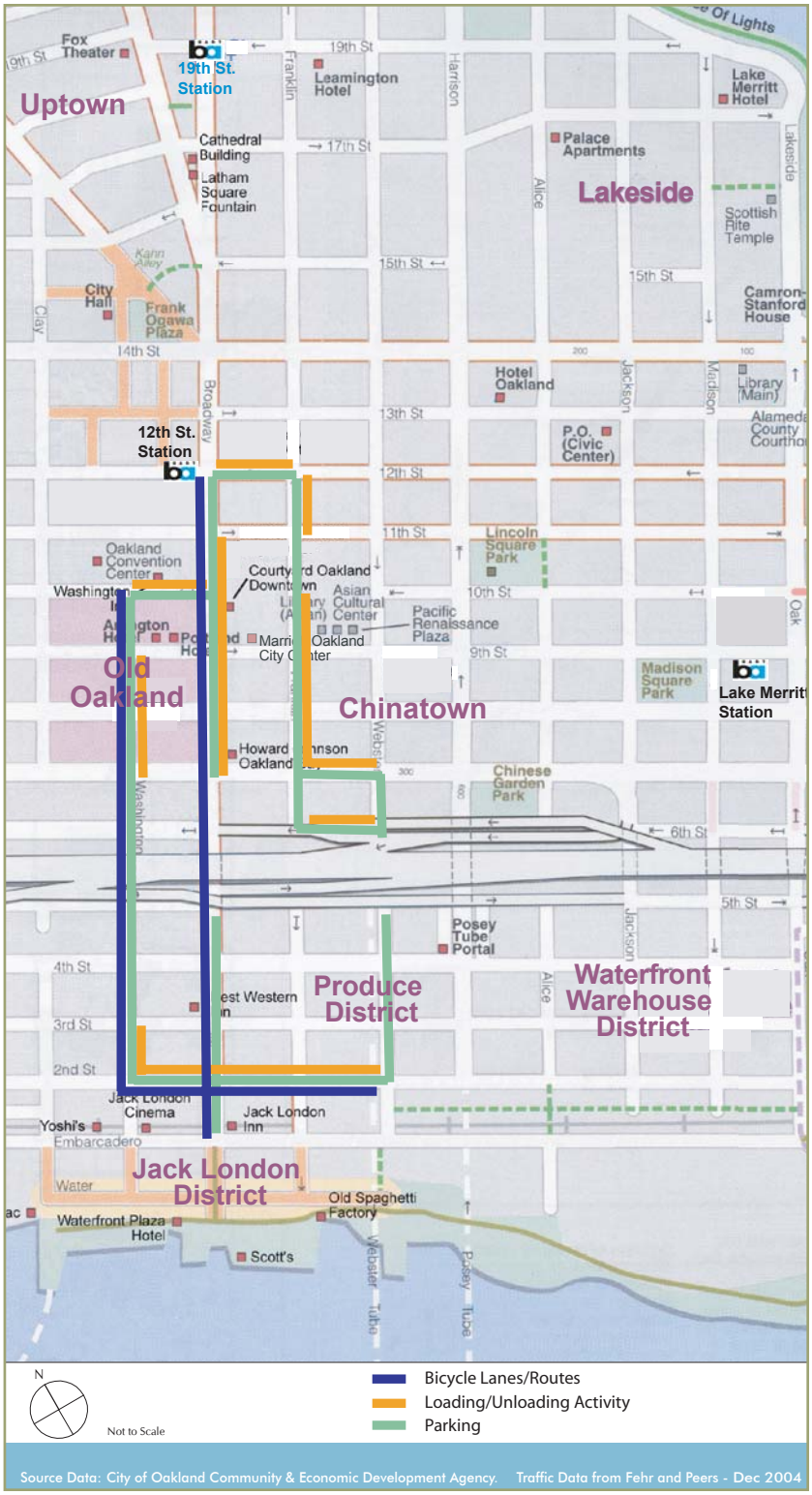
along 2nd Street. A possible solution is to limit truck operations along the corridor to night-delivery only. If the delivery trucks cannot be fully regulated, the streetcar operations would be delayed by double parked trucks.

In addition to the location-specific issues, there are three areawide concerns that warrant attention (See diagram to the right):

- **Parking:** Parking maneuvers could hamper streetcar progression and schedule adherence, and streetcar delays would impact general traffic as well.
- **Truck Activity:** Delivery truck schedules and/or drop-off locations would have to be altered to accommodate the streetcar operations. Any double parking in the streetcar travel lane would effectively stop streetcar operations and impact the vehicular traffic as well.
- **Bicycle Routes:** The streetcar might present a hazard to bicyclists when riding along or crossing the tracks. Bike lanes and routes in the study area would have to be moved off of the streetcar route.

Of the two alignment options, the Broadway "Spine" option appears to present fewer operational issues than the "Small" Loop. In both cases, however, the above challenges would need to be subjected to more detailed study in order to define a preferred streetcar alignment. Additional engineering and community involvement will be required to fully address street function and performance, streetscape, and character issues related to the multimodal use of streets along the streetcar alignments.

AREAWIDE TRAFFIC CONCERNS DIAGRAM



"...Both the sleek, modern streetcars and the old-time, vintage trolley car can generate a tremendous amount of local excitement and enthusiasm for what many consider a great community amenity."

STREETCAR FUNDING CONCEPTS

Streetcar projects have been developed in several cities across the United States in recent years and dozens more are in the planning stages in cities as large as Philadelphia and Los Angeles and as small as Racine, Wisconsin and Salem, Oregon.

Most recent projects have relied on local funding to cover at least part of the capital costs of construction. The specific sources of these local funds used vary widely from bonding against future city parking revenue in Portland, to a hotel tax in New Orleans, to capital funds allocated from regional Metropolitan Planning Organizations (MPOs), to local transit operators, in the case of several other cities.

5.1 Capital Funding

In the case of Oakland, there is a projected $60 - $75 million available for City of Oakland-sponsored transportation projects over the next 25 years. Meanwhile, the total amount of funds requested by projects in the current Countywide Transportation Plan already greatly exceeds that amount. At this time, it does not appear that any additional transportation funds will be made available from the State of California to the City of Oakland in the near future, given the fiscal and political environment in Sacramento. To compete for funds in the near term, more money would have to become available for transportation projects, and the streetcar project would have to receive a high prioritization from local elected officials.

Some streetcar projects have used federal money for capital construction, although generally in a form distributed by regional MPOs. Funding from the highly competitive federal "New Starts" program for new rail systems has not been a major component of streetcars funding to date. Typically, streetcar projects do not score well on the Federal Transit Administration criteria, which are aimed at achieving travel times savings for large numbers of commuters. Streetcars carry smaller numbers of patrons and are often used for pedestrian activation, placemaking, and downtown economic development.

To assist funding for smaller scaled transit projects like streetcars and bus rapid transit, Congress is considering adding a "Small Starts" funding program for streetcars in the federal transportation reauthorization bill (known as TEA-LU). If passed by Congress, this grant program would provide funding for projects with a federal cost share of between $25 million and $75 million. Total funding over six years would be about $935 million. In the future, this program could be a potential source of funds for an Oakland streetcar. The federal "New Starts" programs still rely on some type of local match. The first step to attaining federal money is to have a project in the Countywide Transportation Plan and the Regional Transportation Plan.

Another type of funding used in the capital development of streetcar projects is money gathered from voluntary local improvement districts. These are mechanisms used by property owners to tax themselves in order to provide some specific local benefit in a designated zone. In Portland, about $9.5 million or 17% of the total project costs were raised this way, with a new streetcar line being planned in Seattle expected to generate over 50% of project costs from a Local Improvement District. Property owners may be willing to help finance a streetcar, given its tendency to add value to nearby property and to encourage local economic development.

A preliminary analysis by BART staff has determined that if an assessment district were established in downtown Oakland, similar to Portland's with similar tax rates, it would generate about 10-14% of project costs, depending upon the streetcar alignment chosen (assumes an assessment zone within an approximate two-block radius of the streetcar route). The establishment of such a district would require the consent of the owners of 50% of the taxable assessed value. This type of special district in Oakland could alternatively be used to raise funds for the streetcar's ongoing operating costs.

5.2 Operations Funding

For most cities and transit agencies, identifying revenue sources for ongoing transit operations is even more of a challenge than funding construction. Fortunately, recent streetcar systems have used an array of creative means to keep their streetcars rolling. In fact, Tampa's electric streetcar operates without any traditional local public subsidies at all.

Collecting fares from riders is one obvious method of offsetting operating costs. While some streetcars are free, like Tacoma's, a majority of recently established streetcars do charge for fares, such as Charlotte, Memphis and the Muni F line in San Francisco. Farebox revenue in Tampa represents about 25% of total operating costs.

If fares were charged on a streetcar in downtown Oakland, they could make a respectable contribution to operating revenues. Given the projected ridership of a streetcar on Broadway, and based on a $1 fare per ride, the farebox could generate about $400,000 annually, or about 20% of the total operating costs.

It is extremely rare for federal or state transportation funds to be used to subsidize streetcar operations. In Tampa, Congestion Mitigation and Air Quality (CMAQ) funds were used for a period of three years while the city built an endowment fund aimed at using the interest for streetcar operations. In most cases, though, the primary method of funding streetcars is normal public funds dedicated to transit operations.

There is a possibility that new streetcar service on Broadway could reduce AC Transit operating costs, since it might allow for the diversion of some bus service along Broadway. A detailed understanding of how a streetcar operation would mesh with AC Transit service, however, would have to be studied in more detail.

Several streetcar systems have been successful in acquiring private funds for their operations. Since streetcars add value to property near the line, local improvement districts have been used to raise funds voluntarily from private property owners. While Portland used these types of funds to cover one-time capital costs, Tampa has used

The streetcars that used to serve downtown Oakland and neighborhoods beyond could be reintroduced to the city. Historic trolleys are often a big draw for tourists and everyday riders.

them to help offset their ongoing operations. At a rate of $0.33 per $1,000 in taxable assessed value, they have raised enough funds to cover about 25% of operating costs. Oakland could follow the Tampa model. If the same rates used in Tampa were applied in Oakland, then a local streetcar assessment district would generate roughly $250,000, or about 12.5% of total operating costs.

Another method to bring in private funds includes advertising on the outside of the streetcars or on the inside of the cars above the windows, similar to many bus and metro systems. Also, the streetcar operator can offer sponsorships or naming rights for streetcar stops or for the trolley vehicles themselves. For example, Tampa used this strategy to raise about $5 million from entities like Time Warner, Suntrust Bank, and the Tampa Port Authority to build an endowment fund to support streetcar operations though interest payments.

Both the sleek, modern streetcars and the old-time, vintage trolley car can generate a tremendous amount of local excitement and enthusiasm for what many consider a great community amenity. In fact, some may be so enthusiastic that they are willing to make their own voluntary financial or in-kind contribution or support a local improvement district to see the project succeed. For example, Portland raised $30,000 for first year operations through ticket sales for an inaugural event. Finally, several streetcar systems, such as Tuscon, San Francisco, and Dallas use volunteer labor to operate, maintain, or promote historic trolleys.

CONCLUSIONS

This study concludes the first step of the planning process for transit improvements between 12th Street and Jack London Square. A typical Transit Project Development Process such as this takes anywhere from four to ten years from the initial conceptual planning to operation. This study represents the first stage of a multi-step process: Conceptual Planning.

The key summary points from the study are as follows:

- **There is a desire for an improved transit link from downtown to JLS and a circulator between neighborhoods.**
- **A streetcar is the favorite transit mode for the long-term, partly due to its ability to stimulate development and add interest to downtown.**
- **BART could provide a long-term link to Jack London Square via a new line to Alameda.**
- **Although less popular, rubber-tire bus or shuttle is a viable short-term alternative.**

This final section also includes lessons from other cities on the benefit of nonprofit streetcar advocacy groups and potential next steps emerging from this study.

6.1 Lessons from Other Cities

Across the country, nonprofit organizations have played a vital role in both the development and ongoing operation of streetcar transit services. As advocates, these groups have helped to build support for streetcar projects, keeping them in the public eye until they were successfully implemented. The Tampa & Ybor City Street Railway Society in Tampa, Florida spent over a decade acting as a proponent of that city's existing TECO streetcar line. In San Francisco, the Market Street Railway's advocacy for streetcars includes a website, a quarterly newsletter, and solicitations for donations to support their activities.

Nonprofits groups have also been involved in acquiring and restoring historic vehicles used in streetcar systems. The Market Street Railway helped to acquire funding for the restoration of vintage "PCC" streetcars and also acquired rare trolleys from around the world for San Francisco's F-line. They have also created informational displays inside the streetcars and clean the car interiors. In a similar vein, the Tampa & Ybor City Street Railway Society has acted as the "locator, curator, and restorer of original Tampa Streetcar artifacts." Their focus has been on the restoration of vintage historic Tampa trolley cars through the use of volunteer labor.

In some cases, nonprofit organizations have actually operated streetcars. Charlotte Trolley in Charlotte, North Carolina started as a grassroots effort operating a limited schedule streetcar in 1996 on a city-owned rights-of-way. The line has since been upgraded with operations turned over to the local transit operator and the line integrated into the city's overall transit network. The organization, however, still exists as a "friends of the trolley" support organization.

In Portland, Oregon, the nonprofit corporation "Portland Streetcar Inc" manages the development, construction, and operation of the streetcar. "Tampa Streetcar Inc." is another nonprofit that manages streetcar operations and contracts with a local government transit agency to operate the service. The ability to acquire donations and to use volunteer labor are advantages of a nonprofit managing a trolley line. In addition, if the streetcar has a dedicated source of funding, such as a local business assessment district, then segregating and protecting these funds from competing priorities may be easier if managed by a single purpose nonprofit.

Following the lead of other cities, citizens in Oakland who are enthusiastic about a downtown streetcar could join together to form a nonprofit organization. This group could promote the streetcar concept, build enthusiasm for it, explore creative funding opportunities, and generally help to keep the vision alive.

6.2 Next Steps

Those involved in this project, whether community members, elected officials, or the Project Team all agree on the need for a better connection between the City Center area and Jack London Square. There is also strong desire for improved connections between downtown neighborhoods.

A new type of transit service could provide a valuable source of mobility, as well as a mechanism for stimulating development in the Jack London District. Generally, because of its abilities to satisfy these goals, the streetcar was the preferred long-term technology for most participants. Given the length of time required to develop a streetcar system and the uncertainty of funding, however, there is strong support for an enhanced bus or shuttle service in the short term.

To develop a streetcar system, the next step in the process would be to identify funding sources to begin the initiation of the environmental review process and for project capital costs. This would be followed by a design and bid stage with a construction/test stage to follow. The full operation of a new streetcar service would occur no sooner than 2009 and more likely would not occur until the 2010's, even if funding is identified in the near term.

The following are some future steps that were identified by those involved in the study.

THE NEXT STEPS ARE:

- **City of Alameda, BART, and City of Oakland to consider underground BART shuttle concept as part of Alameda multimodal study.**
- **City of Oakland to work with the private sector to implement a limited shuttle bus service to the Jack London District.**
- **Streetcar proponents to consider the creation of Oakland Streetcar nonprofit organization as a focal point to advocate and promote streetcar concept.**
- **Potential nonprofit to work with public agencies to identify funding opportunities.**
- **Potential nonprofit to seek funding for detailed streetcar feasibility study prior to environmental analysis.**

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